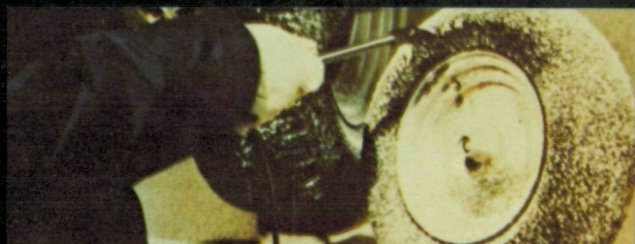
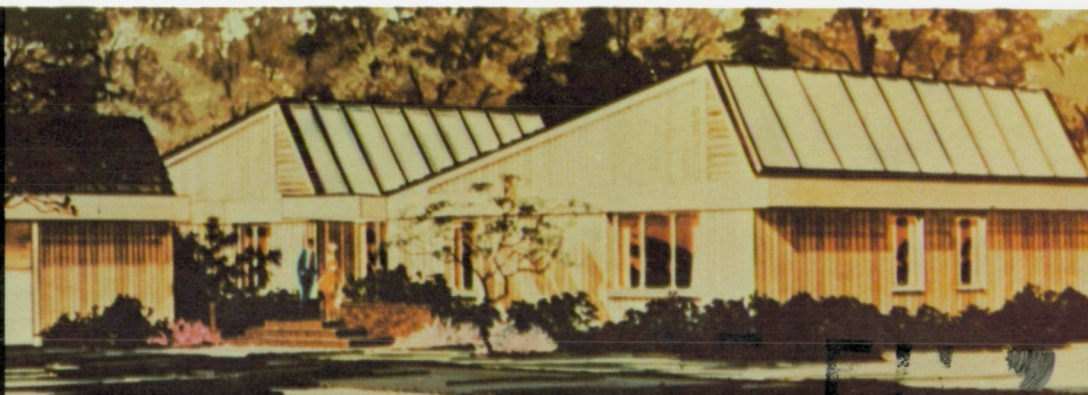


# NASA Tech Briefs

## Index 1976

National  
Aeronautics and  
Space  
Administration



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# INTRODUCTION

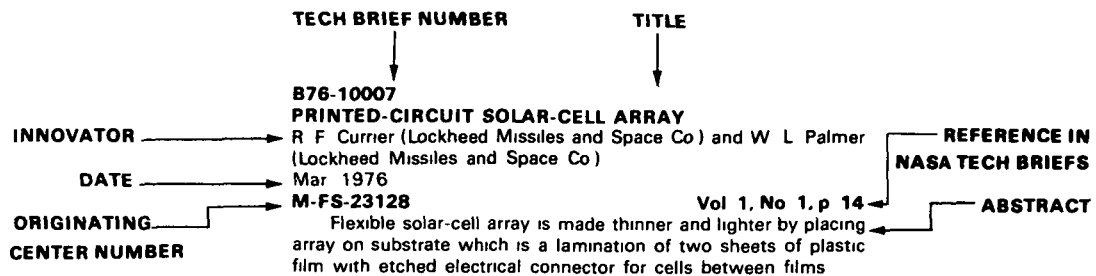
Tech Briefs are short announcements of new technology derived from the research and development activities of the National Aeronautics and Space Administration. These briefs emphasize information considered likely to be transferrable across industrial, regional, or disciplinary lines and are issued to encourage commercial application.

This *Index to NASA Tech Briefs* contains abstracts and four indexes -- subject, personal author, originating Center, and Tech Brief number -- for 1976 Tech Briefs.

## Abstract Section

The abstract section is divided into nine categories: Electronic Components and Circuits; Electronic Systems, Physical Sciences; Materials; Life Sciences; Mechanics; Machinery; Fabrication Technology; and Mathematics and Information Sciences. Within each category, abstracts are arranged sequentially by Tech Brief number.

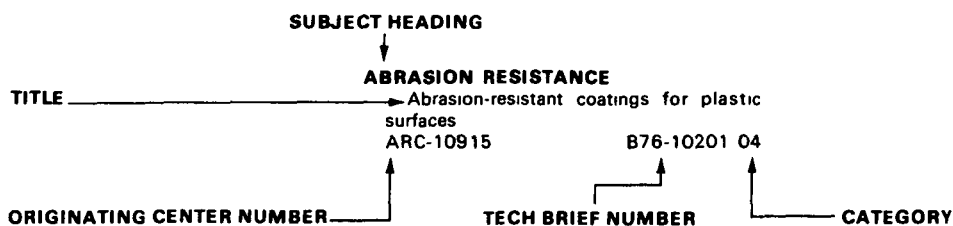
A typical abstract entry has these elements:



The originating Center number in each entry includes an alphabetical prefix that identifies the NASA Center where the Tech Brief originated. A list of prefixes and the corresponding Center names are given on page iii.

## Indexes

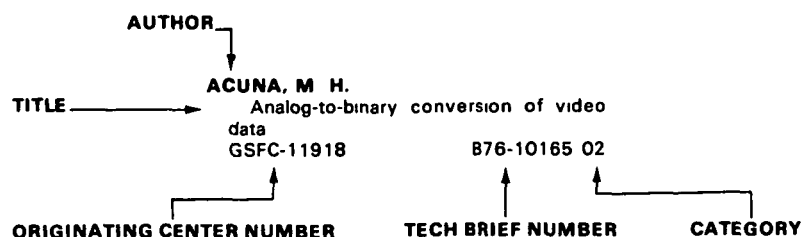
Four indexes are provided. The first is a subject index, arranged alphabetically by subject heading. Each entry in the subject index includes a Tech Brief number and a category number to aid the user in locating pertinent entries in the abstract section.





The January 1976 edition of the *NASA Thesaurus* (NASA SP-7050) is used as the authority for the indexing vocabulary that appears in the subject index. The *NASA Thesaurus* should be consulted in examining the current indexing vocabulary, including associated cross-reference structure. Only the subject terms that have been selected to describe the documents abstracted in this issue appear in the subject index. Copies of the *NASA Thesaurus* may be obtained from the National Technical Information Service or the U.S. Government Printing Office at \$23.50 for the two-volume set.

The second index is a personal author index. Entries in this index are arranged alphabetically by author's name. Tech Brief and category numbers are supplied to help the user find the appropriate entries in the abstract section.



The third index relates each originating Center number to the corresponding Tech Brief number and category. Entries in this index are arranged in alphanumeric order by Center number.



The fourth index relates each Tech Brief number to its originating Center number. Entries are arranged in ascending Tech Brief number order.





## Originating Center Prefixes

ARC	Ames Research Center
GSFC	Goddard Space Flight Center
HQ	NASA Headquarters
KSC	Kennedy Space Center
LANGLEY	Langley Research Center
LEWIS	Lewis Research Center
M-FS	Marshall Space Flight Center
MSC	Johnson Space Center (formerly Manned Spacecraft Center)
NPO	Jet Propulsion Laboratory/NASA Pasadena Office

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# Index to NASA Tech Briefs

February 1977

## Abstract Section

### 01 ELECTRONIC COMPONENTS AND CIRCUITS

**B76-10001**

#### **PLUG-IN LIGHT SWITCHES**

E J Stringer (Rockwell Intern Corp)

Mar 1976

**M-FS-24183**

Vol 1, No 1, p 9

New concept in electrical hardware for buildings is safer, less expensive to manufacture, and easier to install than conventional wall receptacles.

**B76-10002**

#### **DIP EXTRACTOR SIMPLIFIES CIRCUIT REMOVAL**

T Nies (Honeywell Inc)

Mar 1976

**MSC-12712**

Vol 1, No 1, p 10

Easily constructed tool can be used to pull dual in-line packaged integrated circuits off printed-wiring boards without damaging pins. Extractor can be designed for most popular IC configurations and sizes.

**B76-10003**

#### **SUPERCONDUCTIVE NEURISTOR R-JUNCTION**

S A Reible (Wisconsin Univ)

Mar 1976

**HQN-10871**

Vol 1, No 1, p 11

Device incorporating specially-configured pure metal transition region can be developed to simulate a nerve cell. Combination of such cells may be formed to simulate an eye or brain and can be used in recognizing characters and other visual images.

**B76-10004**

#### **ECONOMICAL CUSTOM LSI ARRAYS**

A Feller (RCA), A Smith (RCA), P Ramondetta (RCA), R Noto (RCA), and T Lombardi (RCA)

Mar 1976

**M-FS-23262**

Vol 1, No 1, p 12

Automatic design technique uses standard circuit cells for producing large-scale integrated arrays. Computerized fabrication process provides individual cells of high density and efficiency, quick turnaround time, low cost, and ease of corrections for changes and errors.

**B76-10005**

#### **ULTRA-HIGH-VACUUM ELECTRICAL FEEDTHROUGH**

J R Gavalier (Westinghouse Elec Corp) and M A Janocko (Westinghouse Elec Corp)

Mar 1976

**HQN-10799**

Vol 1, No 1, p 13

Device for cathodic sputtering utilizes cathode dark-space region adjacent to high negative-potential surfaces. Feedthrough is made of metal and glass, is helium leaktight, and is bakeable; it can be incorporated into any vacuum apparatus.

**B76-10006**

#### **TRIPLE-LAYER BUBBLE-DOMAIN FILM**

R D Henry (Rockwell Intern Corp)

Mar 1976

**LANGLEY-11755**

Vol 1, No 1, p 14

Stratified composite improves translational velocity while providing hard-bubble suppression and eliminating coercive field inhomogeneities.

**B76-10007**

#### **PRINTED-CIRCUIT SOLAR-CELL ARRAY**

R F Currier (Lockheed Missiles and Space Co) and W L Palmer (Lockheed Missiles and Space Co)

Mar 1976

**M-FS-23128**

Vol 1, No 1, p 14

Flexible solar-cell array is made thinner and lighter by placing array on substrate which is a lamination of two sheets of plastic film with etched electrical connector for cells between films.

**B76-10008**

#### **IMPROVED WET-SLUG CAPACITOR**

C M Ward (Martin Marietta Corp)

Mar 1976 See also B74-10294, B75-10274

**LANGLEY-11720**

Vol 1, No 1, p 15

Capacitor uses all-tantalum seals and straight, ungelled, 30 percent sulphuric acid electrolyte to reduce leakage from order of milliamperes to low-microampere region. Design offers better reliability in severe environments encountered in military and industrial electronics systems.

**B76-10009**

#### **A/D CONVERTER**

M D Mason (Martin Marietta Corp)

Mar 1976

**LANGLEY-11319**

Vol 1, No 1, p 16

Two-part dual-slope system converts both low-level and high-level analog signals at 500 8-bit words/second with an accuracy of 3 percent.

**B76-10010**

#### **CONTROL LOGIC FOR SUCCESSIVE-APPROXIMATION**

##### **A/D CONVERTERS**

T O Anderson

Mar 1976

**NPO-11937**

Vol 1, No 1, p 18

Iterative building-block approach is used to minimize component count. Modular design has same logic structure for all bits.

**B76-10011**

#### **M-ARY SHIFT REGISTER**

M Perlman

Mar 1976

**NPO-11868**

Vol 1, No 1, p 19

Binary devices are used to construct an m-ary linear feedback shift register.

## 01 ELECTRONIC COMPONENTS AND CIRCUITS

**B76-10012**

### **IMPROVED MICROBRIDGE JOSEPHSON DEVICES**

P N Peters and L B Holdeman (Natl Acad of Sci)

Mar 1976

**M-FS-23274**

**Vol 1, No 1, p 20**

Germanium overcoating of superconducting microbridges protects against electrical noise but does not limit sensitivity

**B76-10013**

### **INCREASED SAFETY IN MERCURY-CONTAINING DEVICES**

G S Evans (Westinghouse Elec Corp)

Mar 1976

**M-FS-23308**

**Vol 1, No 1, p 20**

Amalgamating metal, such as gold tin, lead, cadmium, or indium, included inside mercury lamps reduces amount of escaping mercury vapor when lamps are fractured

**B76-10014**

### **ORGANIC ADHESIVES FOR HYBRID MICROCIRCUITS**

K L Perkins (Rockwell Intern Corp) and J J Lican (Rockwell Intern Corp)

Mar 1976

**M-FS-23370**

**Vol 1, No 1, p 21**

Engineering design guidelines enumerate and briefly describe selected adhesive properties. General review of polymeric types of adhesives is included and major types of commercially available adhesives specifically designed for microelectronic use are identified

**B76-10015**

### **POLYMER ADHESIVES FOR HYBRID CIRCUITS**

S V Caruso and J O Honeycutt

Mar 1976

**M-FS-23287**

**Vol 1, No 1, p 21**

Report discusses number of tests used in comparing polymer adhesives with metal bonding processes and includes charts and photographs to illustrate test results. Findings suggest reduced quality control costs when epoxies are used in fabrication of microcircuits

**B76-10137**

### **TRANSISTOR-TO-SUBSTRATE BOND QUALITY**

T A Telfer (GE)

Aug 1976

**M-FS-21931**

**Vol 1, No 2, p 151**

Quantitative measurement of X-ray images of bonded power-transistor chips is accomplished by using a light meter, which determines percentage of voids in bond

**B76-10138**

### **DC-TO-DC CONVERSION WITH VOLTAGE MULTIPLIERS**

W T Harrigill, Jr and I T Myers

Aug 1976 See also NASA-TM-X-71566 (N74-26737),

NASA-TM-X-71735 (N74-23851)

**LEWIS-12297**

**Vol 1, No 2, p 152**

Compact device uses transformerless capacitor/diode voltage multiplier. Advantages include efficiency at high power levels, increased reliability due to elimination of magnetics and associated electrical transients, no magnetic shielding requirement, and adaptability to modular or integrated circuit systems

**B76-10139**

### **MODULAR DESIGN OF HIGH FREQUENCY CIRCUITS**

J T Zimmer (Raytheon Co)

Aug 1976

**M-FS-23408**

**Vol 1, No 2, p 153**

Method of circuit development separates electrical functions into noninterdependent parts, uses standard commercially available circuit elements, and establishes unified circuit-packaging arrangement. Packaging scheme is cost-effective, does not compromise electrical circuit performance from video to UHF frequencies and leaves circuits accessible for modification and adjustment

**B76-10140**

### **FLUORESCENT-LAMP POWER SUPPLY**

W E Milberger (Westinghouse Elec Corp)

Aug 1976

**MSC-14900**

**Vol 1, No 2, p 154**

High-efficiency cost-effective power source employs resonant circuit to change modes when passing from starting to running condition

**B76-10141**

### **COMPACT RECONDITIONER FOR NI/CD CELLS**

R E Kapustka

Aug 1976

**M-FS-23270**

**Vol 1, No 2, p 155**

Extension of life of multiple-cell nickel-cadmium battery packs is accomplished by reconditioning method requiring discharge of each battery cell. Compact and lightweight dc-to-dc converter replaces relay-sensor system, protecting against voltage-reversal damage, and monitors overall cell condition

**B76-10142**

### **SOLID-STATE PARTICLE DETECTORS**

J R Gigante (Maryland Univ) and R A Lundgren (Maryland Univ)

Aug 1976

**GSFC-11785**

**Vol 1, No 2, p 156**

Fabrication technique, involving change in ratio of resistance of alkali metal diffused layer to thickness of depletion layer, enhances sensitivity in nuclear-particle detectors

**B76-10143**

### **REMOVAL OF ENCAPSULATING MATERIALS**

G L Jacobs (Sperry Rand Corp)

Aug 1976

**GSFC-11696**

**Vol 1, No 2, p 157**

Techniques involving softening or dissolving of potting materials leaves electronics unaffected. Procedure may be used with almost any solvent or plastic within acceptable temperature and pressure ranges

**B76-10144**

### **HIGH-TEMPERATURE FLAT-CONDUCTOR CABLE**

W S Rigling (Martin Marietta Corp)

Aug 1976

**M-FS-23451**

**Vol 1, No 2, p 157**

Temperature limit of 25-conductor signal cable and 3-conductor power cable fabricated using woven and roll laminated technique, increased from 200 C to 350 C when polyimide/fluorinated ethylene propylene or polytetrafluoroethylene insulation films and fluorinated ethylene propylene as adhesive medium is applied

**B76-10145**

### **IMPROVED SOLDERING IRON TIP**

M A Vanasse (Rockwell Intern Corp)

Aug 1976

**M-FS-19349**

**Vol 1, No 2, p 158**

Nickel-plated device with machined recesses matching the multipin pattern of a particular circuit module, facilitates repairs to electronic systems and reduces chance of damage to adjacent components. Nickel-plating reduces oxidation and scaling. Recesses retain sufficient amount of molten solder to uniformly wet pins for simultaneous heating and extraction

**B76-10146**

### **CONNECTOR CONTACT-RING BUS**

J Ligon (Rockwell Intern Corp)

Aug 1976

**MSC-19480**

**Vol 1, No 2, p 159**

Use of device eliminates crimp connectors and ferrules, resulting in compact termination assembly and efficient use of back-shell space. Pair of insulator rings, one at each end of assembly, provides spacing between disc caps and contact rings

**B76-10147**

### **WAVEGUIDE-TO-COAX TRANSITION/LOW-PASS FILTER**

R B Quinn

Aug 1976

**NPO-13642** Vol 1, No 2, p 160  
Low-insertion-loss combination device operates at 4.5 K and has reflection coefficient of better than -21 dB

**B76-10148**  
**POWER-CONTROL SWITCH**  
L. L. Kessler (Westinghouse Elec. Corp.)  
Aug 1976

**M-FS-23395** Vol 1, No 2, p 161  
Constant-current source creates drive current independent of input-voltage variations, 50 percent reduction in power loss in base drive circuitry, maintains essentially constant charge rate, and improves rise-time consistency over input voltage range

**B76-10149**  
**CMOS-COMPATIBLE TRISTATE CABLE DRIVER**  
R. L. Pryor (RCA)  
Aug 1976

**M-FS-23410** Vol 1, No 2, p 162  
Device provides noise immunity, draws zero standby power, and improves performance where same bus connects several pieces of CMOS equipment

**B76-10150**  
**ELECTRICAL-CONDUIT SIZING GAGE**  
C. E. Caveness (Rockwell Intern. Corp.)  
Aug 1976

**MSC-19491** Vol 1, No 2, p 163  
Device indicates trade-size number of electrical conduit without use of tables or references

**B76-10151**  
**TESTING FLAT-CONDUCTOR CABLE**  
R. W. Loggins and R. H. Herndon  
Aug 1976

**M-FS-23174** Vol 1, No 2, p 164  
Report describes characteristics of type of FCC which consists of three AWG No. 12 flat copper conductors laminated between two films of polyethylene terephthalate (Mylar) insulation with self-extinguishing polyester adhesive

**B76-10152**  
**SURFACE MOUNTED FLAT-CONDUCTOR CABLE**  
J. D. Hankins and J. R. Carden  
Aug 1976

**M-FS-223135** Vol 1, No 2, p 164  
Report presents drawbacks and advantages of FCC for home wiring. Two types of surface-wiring schemes are considered: snap-on baseboard and extendable baseboard. Both types lower installation cost and time.

**B76-10153**  
**TEMPERATURE RISE OF INSTALLED FCC**  
J. D. Hankins  
Aug 1976

**M-FS-23127** Vol 1, No 2, p 164  
Report discusses temperature profiles of installed FCC for wood and tile surfaces. Three-conductor FCC was tested at twice nominal current-carrying capacity over bare floor and under carpet, with result indicating that temperature rise is not a linear function of current with FCC at this level.

**B76-10154**  
**FLAT-CONDUCTOR CABLE BASEBOARD**  
J. D. Hankins  
Aug 1976

**M-FS-23141** Vol 1, No 2, p 165  
Report presents procedures and results of test of FCC baseboard system developed for use in commercial and residential applications. Mechanical, electrical, chemical, environmental, thermal, and analytical tests subjected system to conditions of greater severity than would be encountered in normal service, system withstood tests favorably.

**B76-10155**  
**MANUFACTURE OF FLAT-CONDUCTOR CABLE**

W. Angele  
Aug 1976

**M-FS-23121** Vol 1, No 2, p 165  
Report discusses cable design and fabrication of both unshielded and shielded FCC. Discussion includes numerous cable configurations and fabrication processes, such as laminating, etching, extruding, and weaving. Bibliography lists additional references.

**B76-10156**  
**ELECTRONIC CIRCUITS** Vol 1, No 2, p 166  
Innovator not given Aug 1976 See also NASA-SP-5972(07)  
**HQN-10894**

Twenty-nine circuits and circuit techniques developed for communications and instrumentation technology are described. Topics include pulse-code modulation, phase-locked loops, data coding, data recording, detection circuits, logic circuits, oscillators, and amplifiers.

**B76-10157**  
**ELECTRICAL-CABLE DESIGN GUIDE**  
G. A. Phelps (Rockwell Intern. Corp.)  
Aug 1976

**M-FS-24280** Vol 1, No 2, p 166  
Formulas and tables are provided to aid designers in determining electrical cable jacket sizes, number of wires per lay pattern, filler material requirements, jacket wall thickness, and overall cable diameters.

**B76-10158**  
**INSTALLATION OF SURFACE-MOUNTED FLAT-CONDUCTOR CABLE**  
J. R. Carden  
Aug 1976

**M-FS-23266** Vol 1, No 2, p 166  
Guide describes step-by-step process for installation of interior surface-mounted FCC used in commercial and residential buildings. Photographs illustrate how cable-riser and baseboard covers are installed as well as receptacle assembly and receptacle-cover replacement.

**B76-10159**  
**GUIDELINES FOR MULTIPLE LSI PACKAGING**  
C. J. Peckinpugh (Electron Commun., Inc.)  
Aug 1976

**M-FS-23367** Vol 1, No 2, p 166  
Handbook provides specific guidelines related to ceramic multilayer circuit fabrication in terms of packaging density and interconnection methods, guiding the designer from initial stages of ceramic multilayer interconnection and artwork generation through test pattern utilization, assembly operations, and final inspection and test procedures.

**B76-10290**  
**A NONSATURATING DC-TO-DC PARALLEL POWER CONVERTER**  
T. Lavigna, G. Gant (Xerox Corp.), and L. Jan (Xerox Corp.)  
Jan 1977

**GSFC-12047** Vol 1, No 3, p 311  
Device is conventional circuit modified with pair of diode rectifiers coupled to switching transistors via feedback winding. Transient-causing collector-current overlap between transistors is eliminated. Technique may be used with nonsaturating parallel-transistor converters operating from voltage source which remains fixed or varies over small range.

**B76-10291**  
**A LINEAR PHASE DEMODULATOR**  
R. R. Rippey  
Jan 1977

**GSFC-12018** Vol 1, No 3, p 312  
Circuit operates on feedback principle to reduce modulation index of received signal, and thus reinserts carrier component in suppressed carrier signal. Device can demodulate phase-shift-keyed signals which do not have carrier component, and it has linear region of plus or minus 150 deg.



## 01 ELECTRONIC COMPONENTS AND CIRCUITS

### B76-10292

#### FLUORESCENT DIMMING BALLAST

P Lutus (ILC Technol)

Jan 1977

MSC-14937

Vol 1, No 3, p 313

High-frequency inverter and saturable inductor control fluorescent lighting system operating from 20 kHz power supply. Filament power is unaffected, and only ballast is controlled.

### B76-10293

#### TOROIDAL CONVERTER CORE

W T McLyman

Jan 1977

NPO-13413

Vol 1, No 3, p 314

Improved approach consists of cut and uncut cores nested in concentric configuration. Cores are made by winding steel ribbon on mandrel and impregnating with epoxy to bond layers together. Gap is made by cutting across wound and bonded core. Rough ends are ground or lapped.

### B76-10294

#### COMPOSITE STACKED MOLY-PERMALLOY CORES

W T McLyman

Jan 1977

NPO-13578

Vol 1, No 3, p 316

Composite core comprised of two sections, each having different permeability results in size and weight reduction. One section provides sufficient induction under light loading conditions, while other section offers minimum inductance under heavy loading.

### B76-10295

#### BAND-ELIMINATION FILTER

G B Shelton (Sperry Support Services)

Jan 1977

M-FS-23303

Vol 1, No 3, p 317

Helical resonator is employed to produce stable, highly selective filter. Other features of filter include controlled bandwidth by cascading identical stages and stagger tuning, adjustable notch depth, good isolation between stages, gain set by proper choice of resistors, and elimination of spurious responses.

### B76-10296

#### COUNTING DIGITAL FILTER

S Zohar

Jan 1977 See also B76-10297, B76-10298, B76-10299

NPO-11821

Vol 1, No 3, p 318

Overall design of filter combines radix converter with ADC in single functional unit that directly converts analog input to its negative binary representation. Four basic elements of filter are fixed register, shift register, counter, and accumulator.

### B76-10297

#### CIRCULATING-LINES DIGITAL FILTER

S Zohar

Jan 1977 See also B76-10296, B76-10298, B76-10299

NPO-11831

Vol 1, No 3, p 319

Filter has array of line segments of various lengths which may be switched into circulating line by machine operator. Design is useful in cases where filter speed is not critical, by sacrificing speed, filter can be made at lower cost.

### B76-10298

#### PARTITIONED COUNTING DIGITAL FILTER

S Zohar

Jan 1977 See also B76-10296, B76-10297, B76-10299

NPO-11832

Vol 1, No 3, p 320

High-speed variation of counting digital filter implements count in a way which allows shortest permissible spacing between samples of input signal to be small fraction of time it takes to compute output sample.

### B76-10299

#### HYBRID DIGITAL-ANALOG IMPLEMENTATION OF DIGITAL FILTERS

S Zohar

Jan 1977 See also B76-10296, B76-10297, B76-10298

NPO-11833

Vol 1, No 3, p 321

Hybrid device, which is modification of counting digital filter, obtains high speed through lower precision mainly effected by substituting analog device for digital counter.

### B76-10300

#### ELECTRICAL-SPLICING CONNECTOR

E J Stringer (Rockwell Intern Corp)

Jan 1977

M-FS-24254

Vol 1, No 3, p 322

Connection can be made without removing insulation and connector case insulates splice. Device can be made in various sizes and saves time especially when working on prototype boards with several interconnecting test leads.

### B76-10301

#### FOLDBACK CURRENT-LIMITING FOR HYBRID REGULATOR

C H Crider (IBM)

Jan 1977

M-FS-22995

Vol 1, No 3, p 323

Technique utilizes operational high gain amplifier, which greatly reduces temperature sensitivity of short circuit current to amplify and subtract voltage across current sensing resistor from regulated output voltage. Small current sensing resistor may be used to eliminate power loss problem found in conventional circuits.

### B76-10302

#### FEEDBACK ARRANGEMENT FOR REGENERATIVE SWITCHES

W T McLyman

Jan 1977

NPO-13060

Vol 1, No 3, p 324

Load current feedback technique samples load current instead of collector current, which makes it possible to operate switching transistors at their maximum capacities for pulse loads.

### B76-10303

#### LOW-COST PRESSURE-DATA ENCODER

R B Kolbly and S R Hedges

Jan 1977

NPO-13692

Vol 1, No 3, p 325

Electronic encoding altimeter has pulsed output with pulse width proportional to altitude and converts pressure-proportional input voltage to digital signal that may then be routed to monitoring or display equipment.

### B76-10304

#### LOW-VOLTAGE MOTOR HEATER

K R Bezant (TWA)

Jan 1977

KSC-10651

Vol 1, No 3, p 326

Heater has stepdown transformer for low voltage range, variable transformer for holding within 0-to-28 volt range and voltmeters and ammeters to monitor load and wattage. Regulated thermostat controls contactor, permitting heater to cycle.

### B76-10305

#### MULTIPLE-LAYER PRINTED-WIRING TRACE CONNECTOR

D E Pizeck

Jan 1977

LANGLEY-11709

Vol 1, No 3, p 327

Nickel-plated spring-steel foil connector is hollow pin with lengthwise slit, that is inserted into improperly plated-through holes. Edges of connector make positive contact with copper pads within hole.

### B76-10306

#### BATTERY SINGLE-CELL PROTECTION SYSTEM

R D Thomas and W J Nagle

Jan 1977

LEWIS-12039

Vol 1, No 3, p 328

Protective circuit consists of solid state comparator switch and high current switching device combined into single module.

which can be mounted directly on each cell as part of cell or battery case construction. System prohibits driving cells beyond set voltage limits and allows deeper discharge without cell reversal.

**B76-10307****WIDEBAND DISTRIBUTION AMPLIFIER**

C F Foster

Jan 1977

**NPO-13256**

Vol 1, No 3, p 330

Device provides 12 outputs isolated from each other by 70 dB at 100 MHz, frequency range of 0.1 to 100 MHz, less than 2 deg phase shift over temperature change of 0 to 50 C, and computer level output to monitor module signal quality.

**B76-10308****OVERLOAD-PROTECTOR/FAULT-INDICATOR CIRCUIT**

J R Paluka and S F Moore (Resdel Eng Corp)

Jan 1977

**NPO-13592**

Vol 1, No 3, p 331

Circuit incorporates three-terminal current limiter (78M24) to increase overall reliability and to eliminate transistor burnouts resulting from shorted interconnection lines and other overloads. Fast-acting light emitting diodes across the limiters show status of transistor output circuits.

**B76-10309****LOW-FREQUENCY SINE WAVE HARD-LIMITING TECHNIQUE**

T O Anderson

Jan 1977

**NPO-13230**

Vol 1, No 3, p 332

Circuit includes serial-in/parallel-out shift register and weighting network that are used to eliminate effects of noise and other nonrepetitive circuit transients. Register and weighting network average decisions from section of signal where decisions are more dependable or where differences between two consecutive samples are larger.

**B76-10310****SIGNAL LEVEL DETECTOR**

T O Anderson

Jan 1977

**NPO-13272**

Vol 1, No 3, p 333

Frequency-independent circuits measure amplitude of sine waves via Schmitt-trigger circuits, pair of inverters, and two flip-flop stages. Accuracy of unit is limited by Schmitt trigger threshold levels, which depend on temperature and on component variations from unit to unit.

**B76-10311****PLUG-IN CIRCUIT MONITOR**

E J Stringer (Rockwell Intern Corp)

Jan 1977. See also B76-10312

**MSC-19455**

Vol 1, No 3, p 334

Intelligent electronic circuit is used to monitor other circuits within module and to warn of imminent failure of module under surveillance. Monitor is housed in rectangular connector and plugs into mating jack originally designed to terminate flat conductor cables. Device can be made from existing premolded rectangular connectors.

**B76-10312****MICROPROGRAMMABLE MODULE**

E J Stringer (Rockwell Intern Corp)

Jan 1977. See also B76-10311

**MSC-19456**

Vol 1, No 3, p 335

Device is small lightweight selective circuit/function panel that utilizes microelectronic circuits in flat packs to eliminate hard wiring and heavy-harness routing to various subsystems.

**B76-10313****MAJORITY-VOTED LOGIC FAIL-SENSE CIRCUIT**

W T McLyman

Jan 1977

**NPO-13107**

Vol 1, No 3, p 336

Fail-sense circuit has majority-voted logic component which

receives three error voltage signals that are sensed at single point by three error amplifiers. If transistor shorts, only one signal is required to operate. If transistor opens, two signals are required.

**B76-10314****HYBRID THIN-FILM AMPLIFIER**

G Cleveland (Lockheed Missiles and Space Co)

Jan 1977

**MSC-13975**

Vol 1, No 3, p 337

Miniature amplifier for bioelectronic instrumentation consumes only about 100 mW and has frequency response flat to within 0.5 dB from 0.14 to 450 Hz. Device consists of five thin film substrates which contain eight operational amplifiers and seven field-effect transistor dice.

**B76-10315****SOLID-STATE RF SWITCH**

M F Hanna and H K Detweiler

Jan 1977

**NPO-13081**

Vol 1, No 3, p 338

Consisting of NAND gates, switch can be expanded to multipole input and can switch at frequencies up to 30 MHz. Device uses digital integrated circuits to provide isolation between inputs and between input and output parts.

**B76-10316****RAM DIGITAL FILTER**

S Zohar

Jan 1977

**NPO-13659**

Vol 1, No 3, p 339

Modification of conventional digital counting filter is designed to store all possible combinations of filter coefficients in random access memory. Filter includes analog-to-digital converter, X shift register, memory accumulator, and digital-to-analog converter.

**B76-10317****SIMPLIFIED CUT-CORE INDUCTOR**

W T McLyman

Jan 1977

**NPO-13600**

Vol 1, No 3, p 339

Technical memorandum describes design of linear reactor fabricated from grain-oriented steel. It includes design charts and nomographs and illustrates design of grain-oriented inductor via seven-step example. Typical values of core inductance, operating frequency, and coil current (dc and ac) are given.

**B76-10318****MASK ANALYSIS PROGRAM**

M Martin and C L Mitchell (M&amp;S Computing Inc)

Jan 1977

**M-FS-23431**

Vol 1, No 3, p 340

Program uses minimal core and time resources and performs following analysis functions: artwork verification, device identification, nodal analysis, capacitance calculation, and logic equation generation. For data base simplicity, program processing operates on mask data which has been converted from its original form to orthogonal rectangles.

**B76-10439****IMPROVED RESOLUTION FOR SENSOR ARRAYS**

W C Goss

Mar 1977

**NPO-13745**

Vol 1, No 4, p 487

Interpolated algorithm simple enough to hard-wire by hand improves resolution by factor of 5 to 20.

**B76-10440****CHARGE-SENSITIVE AMPLIFIER WITH NOTCHED FREQUENCY RESPONSE**

D F Stout (Martin Marietta Corp) and M D Mason (Martin Marietta Corp)

Mar 1977

**LANGLEY-11317**

Vol 1, No 4, p 488

Charge sensitive amplifier outputs bipolar pulse with maximum peak of 5 volts. This is applied to negative inputs of two high-speed

## 01 ELECTRONIC COMPONENTS AND CIRCUITS

comparators These change output states only if pulse applied to negative inputs exceeds dc bias on their positive inputs Output is transferred to digital event counter

**B76-10441**

### **A PASSIVE CHEVRON REPLICATOR**

T R Oeffinger (Rockwell Intern Corp) and L R Tocci (Rockwell Intern Corp)

Mar 1977

**LANGLEY-11906**

**Vol 1, No 4, p 490**

Instrument design provides replicate function between device storage area and guardrail detector in order that nondestructive read-out of memory can be achieved Use of guardrail detectors in magnetic domain (bubble) circuits is proposed method of increasing detector signal output by increasing detector size without dedicating an excessive amount of device chip area to detector portion

**B76-10442**

### **NEW PASSIVE REPLICATOR FOR BUBBLE DOMAIN DEVICES**

P K George (Rockwell Intern Corp) and T Kobayashi (Rockwell Intern Corp)

Mar 1977

**LANGLEY-11997**

**Vol 1, No 4, p 491**

Bar-spacing tolerances are relaxed in replicator suitable for low-drive field

**B76-10443**

### **CONTINUOUS-DATA FIFO BUBBLE SHIFT REGISTER**

T T Chen (Rockwell Intern Corp)

Mar 1977

**LANGLEY-11862**

**Vol 1, No 4, p 492**

Simple loop first-in-first-out (FIFO) bubble memory shift register has continuous storage capability Bubble shift register simplifies chip-control electronics by enabling all control functions to be aligned at same bit FIFO shift register is constructed from passive replicator and annihilator combinations

**B76-10444**

### **MULTIPLE-BUBBLE DETECTOR**

P K George (Rockwell Intern Corp)

Mar 1977

**LANGLEY-12043**

**Vol 1, No 4, p 493**

Device is segmented multiple-input detector Bubbles are fed into each section simultaneously Detector output is improved by using passive replicators

**B76-10445**

### **INDUCTORLESS VOLTAGE MULTIPLIER/CONVERTER**

L H Bannister (MIT) and R H Baker (MIT)

Mar 1977

**NPO-13757**

**Vol 1, No 4, p 493**

Voltage multiplier configuration consists of identical stages connected in cascade to obtain desired output voltage

**B76-10446**

### **DIGITAL VARYING-FREQUENCY GENERATOR**

M J Allen (Martin Marietta Corp)

Mar 1977

**MSC-16331**

**Vol 1, No 4, p 495**

Generator employs up/down counters, digital-to-analog converters and integrator to determine frequency and time duration of output Circuit can be used where varying signal must be controlled accurately over long period of time

**B76-10447**

### **OPEN-LOOP DIGITAL FREQUENCY MULTIPLIER**

R C Moore (Johns Hopkins Univ)

Mar 1977

**MSC-12709**

**Vol 1, No 4, p 496**

Monostable multivibrator is implemented by using digital integrated circuits where multiplier constant is too large for conventional phase-locked-loop integrated circuit A 400 Hz clock is generated by divide-by-N counter from 1 Hz timing reference

**B76-10448**

### **DIPLEXER SWITCH**

**Vol 1, No 4, p 497**

C H Grauling, Jr (Westinghouse Elec Corp) and T W Parker (Westinghouse Elec Corp)

Mar 1977

**LANGLEY-11546**

Switch achieves high isolation and continuous input/output matching by using resonant coupling structure of diplexer Additionally, dc bias network used to control switch is decoupled from RF input and output lines Voltage transients in external circuits are thus minimized

**B76-10449**

### **DEFLECTION AMPLIFIER FOR IMAGE DISSECTORS**

P M Salomon

Mar 1977

**NPO-13079**

**Vol 1, No 4, p 498**

Balanced symmetrical y-axis amplifier uses zener-diode level shifting to interface operational amplifiers to high voltage bipolar output stages Nominal voltage transfer characteristic is 40 differential output volts per input volt, bandwidth between -3 dB points is approximately 8 kHz loop gain is nominally 89 dB with closed loop gain of 26 dB

**B76-10450**

### **UNIVERSAL SOLAR-CELL TERMINAL**

S Bashin (TRW, Inc) and F G Kelley (TRW Inc)

Mar 1977

**M-FS-23505**

**Vol 1, No 4, p 499**

Terminal, which replaces stakes or lugs in conventional design with loop receptacles for wires from cell and harness, uses dissimilar bonding properties (metal-to-glass and/or ceramics) of iron-nickel-cobalt alloy in conjunction with standard termination

**B76-10451**

### **SOLID-STATE TURN-COORDINATOR DISPLAY**

R K Crouch, W L Kelly, and B D Meredith

Mar 1977 See also NASA-TM-X-7282 (N76-32186)

**LANGLEY-12090**

**Vol 1, No 4, p 500**

Light emitting diodes are employed in displays for aircraft instrument applications Device offers three levels of brightness to compensate for varying degrees of ambient light present in cockpit

**B76-10452**

### **DOPPLER EXTRACTION WITH A DIGITAL VCO**

E R Starnier (RCA) and E J Nossen (RCA)

Mar 1977

**MSC-14814**

**Vol 1, No 4, p 502**

Digitally controlled oscillator in phased-locked loop may be useful for data communications systems, or may be modified to serve as information extraction component of microwave or optical system for collision avoidance or automatic braking Instrument is frequency-synthesizing device with output specified precisely by digital number programmed into frequency register

**B76-10453**

### **SIGNAL ENHANCEMENT FILTERS**

H B Killen (TRW, Inc) and W B Warren (TRW Inc)

Mar 1977 See also NASA-CR-147537 (N76-21369)

**MSC-14907**

**Vol 1, No 4, p 503**

Designed to smooth digital output of radar tracking systems, two filters prevent noise-induced inaccuracies and result in input/output noise-variance reduction on order of 10:1 One filter is special purpose device with limited arithmetic-logic unit and other is true programmable microprocessor

**B76-10454**

### **SERIAL-DATA CORRELATOR/CODE TRANSLATOR**

L E Morgan

Mar 1977

**KSC-11025**

**Vol 1, No 4, p 505**

System consisting of sampling flip flop, memory (either RAM or ROM) and memory buffer correlates sampled data with predetermined acceptance code patterns, translates acceptable



code patterns to nonreturn-to-zero code and identifies data dropouts

**B76-10455****UHF/MICROWAVE OSCILLATOR/AMPLIFIER**

L. L. Kleinberg  
Mar 1977

**GSFC-12113**

Vol 1, No 4, p 505

Circuit uses tunnel diode as negative resistance and bipolar transistor as an active device in conjunction with resistors and capacitors. Transistor provides inductance required to produce oscillation and tuning. Output is taken from transistor collector and avoids unwanted characteristics of two-terminal oscillator/amplifier.

**B76-10458****CAPACITIVELY-COUPLED DATA RECEIVER CLIPPER STAGE**

F. W. Saunders (Singer Co.)  
Mar 1977

**MSC-14989**

Vol 1, No 4, p 507

Circuit technique compensates for dc offset and asymmetry in dc clipping levels, negates unbalance in input waveform that causes voltage offset at end of data word, blocks any dc component that is generated by asymmetrical operation of clipper and improves data threshold detection.

**B76-10457****BIASED-CIRCUIT DIGITAL DATA LINE RECEIVER**

F. C. Fitzgerald (IBM)  
Mar 1977

**MSC-14967**

Vol 1, No 4, p 508

Modified-interface circuit, consisting of input diodes, current sources, and emitter followers transfers data between digital electronic equipment and also aids circuit isolation when driver and all receivers but one are not powered. Circuit rejects spurious noise signals without impeding valid signal transfer.

**B76-10458****LOW-POWER PROGRAMMABLE HIGH-VOLTAGE SUPPLY**

D. F. Stout (Martin Marietta Corp.) and R. A. Perala (Martin Marietta Corp.)  
Mar 1977

**LANGLEY-11316**

Vol 1, No 4, p 508

Converter is used to energize group of proportional-counter event-detection tubes. Supply is programmed by using output signal of low voltage digital-to-analog converter. Programming voltage ranges from 1.53 to 2.91 V in 127 00108 mV steps, and it is used to control converter high voltage output which ranges from 700 to 1.335 V in like number of increments.

**B76-10459****THICK-FILM PREAMPLIFIER**

G. C. Bailey  
Mar 1977

**NPO-13416**

Vol 1, No 4, p 509

Preamplifier with hybrid discrete components and integrated-circuit packaging is designed specifically for use as television image-tube output signal conditioner. Circuit is fabricated on alumina substrate, measuring 0.5 by 0.5 by 0.015 inch using gold-base conductor with conductive gold crossovers and dielectric insulation.

**B76-10460****MICROPROGRAMMED TELEMETRY PROCESSOR**

L. H. Gordon (Hughes Aircraft Co.) and J. B. Shackleford (Hughes Aircraft Co.)  
Mar 1977

**ARC-11061**

Vol 1, No 4, p 511

Minimum hardware, reliable processor responds rapidly to changing requirements simply by changes in contents of programmable read-only memory. General purpose controller can transfer data onto and off of data bus, perform logic and arithmetic manipulations, and store pertinent data in small internal random-access memory.

**B76-10461****SEMICONDUCTOR OHMIC CONTACT**

F. Z. Hawrylo (RCA) and H. Kressel (RCA)  
Mar 1977

**LANGLEY-11691**

Vol 1, No 4, p 512

Contact formed on p-type surface of semiconductor laser has several advantages: highly conductive degenerate region and narrow band gap provides surface for good metal-to-semiconductor contact, lattice parameter of GaAs is 5.6533 Å, improved lattice match eases interface strain which reduces interface cracking of semiconductor material.

**B76-10462****LOW-COST DUAL-FREQUENCY MICROWAVE ANTENNA**

I. Yu. (Lockheed Electronics Co.)  
Mar 1977

**MSC-16100**

Vol 1, No 4, p 513

Antenna is circularly-polarized microwave device with high-band frequency and low-band frequency elements. Relatively low impedance of low-band frequency element can be matched to desired impedance by adding etched matching network.

**B76-10463****ACTIVE RETRODIRECTIVE ANTENNA**

R. C. Chernoff and R. C. Tausworthe  
Mar 1977

**NPO-13641**

Vol 1, No 4, p 514

Active antenna is self-phasing array which transmits signal in direction of remote pilot source. Word 'active' means that transmitted power is generated by sources associated with antenna rather than by reflection of incident signal, as in passive retrodirective antenna. Array is also known as self-focusing array.

**B76-10464****MULTIFREQUENCY, BROADBAND, DUAL-POLARIZED ANTENNA**

K. A. Green (Microwave Res. Corp.)  
Mar 1977

**NPO-13866**

Vol 1, No 4, p 516

Corrugated, conical horn ring-loaded antenna can be fed through vertex of cone with wideband waveguides, such as double-ridged rectangular or quad-ridged circular, or simply ring-loaded, corrugated waveguides. Antenna is also fed through coupling apertures in side of cone at appropriate diameters.

**B76-10465****ANALOG-TO-DIGITAL CONVERSION FOR RADIX (-2)**

S. Zohar  
Mar 1977

**NPO-13093**

Vol 1, No 4, p 517

Device, which converts directly from analog signal to its radix (-2) representation, is based on successive approximation approach.

**B76-10466****POWER SUPPLY WITH OPTICAL-ISOLATOR CONTROL**

R. H. Baker (MIT) and J. T. Wheeler (MIT)  
Mar 1977

**HQN-10827**

Vol 1, No 4, p 519

Power supply consists of several stages interconnected and programmed for required output. In capacitor charging mode, transistor switches are closed. Last stage is in series with rectifier that prevents current from flowing backward into circuit. In capacitor discharge mode, transistor switches are closed, and voltage delivered to load is sum of voltages across capacitors.

**B76-10467****ACTIVE INRUSH-CURRENT LIMITER**

R. A. Kichak  
Mar 1977

**GSFC-11789**

Vol 1, No 4, p 520

By stretching turn-on time from approximately 1 to 200 ms, effects of inrush current (and of associated large current spikes) and current rate of rise ( $di/dt$ ) are made potentially less severe. Limiter arrangement consists of time-variable impedance.

## 01 ELECTRONIC COMPONENTS AND CIRCUITS

connected in series between input dc power source return and power circuit of converter

**B76-10468**

### **ALL-DIGITAL SEQUENCE CORRELATOR**

A Laderman

Mar 1977

**NPO-13737**

Vol 1, No 4, p 521

Correlator can handle long-length pseudonoise sequences by adding shift registers, counters and adders in tree configuration of basic 16-bit scheme Correlation coefficient of unity or zero is generated when all bits of sequence are received and positioned correctly in input shift register

**B76-10469**

### **RELATIVE STIFFNESS OF FLAT-CONDUCTOR CABLE**

J D Hankins

Mar 1977

**M-FS-23537**

Vol 1, No 4, p 522

Bending moment data were taken on ten different cable samples and normalized to express all stiffness factors in terms of cable 5.1 cm in width Relative stiffness data and nominal physical characteristics are tabulated and presented in graphical form for designers who may be interested in finding torques exerted on critical components by short lengths of cable

**B76-10470**

### **TRANSFORMER DESIGN TRADEOFFS**

W T McLyman

Mar 1977

**NPO-13755**

Vol 1, No 4, p 523

Technical memorandum includes transformer area product numbers which are used to summarize dimensional and electrical properties of C-cores, pot cores lamination, powder cores and tape-wound cores To aid in core selection, comparison of five common core materials is presented to indicate their influence on overall transformer efficiency and weight

**B76-10471**

### **DIELECTRIC COVERED ANTENNAS**

J F Lindsey (McDonnell-Douglas Corp)

Mar 1977

**MSC-16186**

Vol 1, No 4, p 523

Because of simplicity and adaptability, new computer program incorporates modified version of plane-wave transmission theory including multiple internal reflections and effects of ground-plane reflection Model assumes isotropic hemispherical radiator from point source with individual rays incident upon several dielectric materials

**B76-10472**

### **ELECTROSTATIC ANALYSIS OF CHARGE-COUPLED STRUCTURES**

J D Gassaway (Mississippi State Univ)

Mar 1977

**M-FS-23507**

Vol 1, No 4, p 524

Package of three computer programs performs two-dimensional electrostatic analysis to determine efficiency of charge transfer One program can be used to analyze three-electrode charge-coupled device input/output gates and other two programs can be used to analyze two-phase structures containing two or four electrodes with periodic boundary conditions

(McDonnell-Douglas Corp), and S D Cornish (McDonnell-Douglas Corp)

Mar 1976

**M-FS-21577**

Vol 1, No 1, p 23

System is capable of detecting ultraviolet light emitted by match size flame at distance of 10 ft System is not affected by high energy or particulate radiation and is therefore particularly suited for applications around nuclear plants and X-ray equipment

**B76-10017**

### **DATA-STORAGE COMPRESSION SCHEME**

P M Salomon and L F Schmidt

Mar 1976

**NPO-13488**

Vol 1, No 1, p 24

System uses scheme which does not respond to redundant data Encoded sensor output signals are transferred to central processing unit only when change occurs in encoded 12-bit word

**B76-10018**

### **ALL-WEATHER ICE INFORMATION SYSTEM**

R J Schertler, R A Mueller, R J Jirberg D W Cooper, J E Heighway, A D Holmes, R T Gedney and H Mark

Mar 1976

**LEWIS-12638**

Vol 1, No 1, p 25

Heart of system consists of two major components side-looking airborne radar system for detecting ice cover and type, and modified short pulse S-band radar system for simultaneously determining ice cover regardless of cloud cover

**B76-10019**

### **GRAPHIC-TO-DIGITAL CONVERSION SYSTEM**

F L Rosenthal (Rockwell Intern Corp)

Mar 1976

**M-FS-24410**

Vol 1, No 1, p 26

Computer-controlled system allows operator to record only those data points selected It consists of commercially available X-Y plotter computer, and A/D and D/A converters New component is strain gage controller and amplifier which can be adapted to existing systems

**B76-10020**

### **SENSOR FOR ANALOG SPEED CONTROLS**

A G Birchenough

Mar 1976 See also NASA-TM-X-3200 (N75-17577)

**LEWIS-12697**

Vol 1, No 1, p 28

System has speed control accuracy within approximately 0.001 percent Accuracy is limited only by crystal reference oscillator, however effect is negligible on original system stability and transient response Design can be adapted to other systems and provides compromise between either fully digital or fully analog systems

**B76-10021**

### **SELECTIVE IMAGE ENHANCEMENT**

R C Gonzalez (Tennessee Univ) and B A Fittes (Tennessee Univ)

Mar 1976

**M-FS-23364**

Vol 1, No 1, p 29

Digital technique for television systems can be used with remote manipulators Algorithm is used to divide image into N-by-N picture elements which may be individually enhanced Enhancement may be controlled with joystick Similar arrangement simplifies remote manipulator operation

**B76-10022**

### **REMOTE ACCESS OF MODEM BY DIGITAL CONTROL**

H Lopez

Mar 1976

**GSFC-11943**

Vol 1, No 1, p 30

Semiautomated system enables operator to measure overall quality of communications link between console (point A) and far-end location (point B) By transmitting test pattern from point A receiving it at point B and transmitting back to point A in loopback, unassisted operator can evaluate overall link performance

## 02 ELECTRONIC SYSTEMS

**B76-10016**

### **ULTRAVIOLET FIRE DETECTOR**

J E Turnage (McDonnell-Douglas Corp), R M F Linford

**B76-10023****PULSE AMPLITUDE DISCRIMINATOR THRESHOLD CALIBRATION**

D P Peletier (Johns Hopkins Univ)

Mar 1976

**GSFC-11912**

Vol 1, No 1, p 31

Closed-loop digital circuit insensitive to drift with age, monitors input signals in particle detector. Basic elements of calibrator are clock circuit, weighting circuit, integrator, and chopper

**B76-10024****ELECTRO-OPTICAL LIQUID DEPTH SENSOR**

D B Heppner (General Dynamics Corp) and S O Atwood (General Dynamics Corp)

Mar 1976

**M-FS-22921**

Vol 1, No 1, p 32

Transducer utilizes absorptive properties of water to determine variations in depth without disturbing liquid. Instrument is inexpensive, simple, and small and thus can be used in lieu of direct graduated scale readout or capacitive ultrasonic resistive or inductive sensors when these are impractical because of complexity or cost

**B76-10025****GENERAL-PURPOSE DATA LINK**

M J Dinkins (GE)

Mar 1976

**M-FS-22714**

Vol 1, No 1, p 33

Communications modem comprising transmitter, demodulator, modulator, and receiver is compatible with telephone line, video pair, or 1,250 ohm twisted wire pair. It permits wide range of input and output voltages and flexible data rates, and it has provision for computer interface

**B76-10026****UNICHROMATIC-CARRIER COLOR-TV SYSTEM**

K H Vorhaben (Lockheed Electronics Co) and P C Lipoma (Lockheed Electronics Co)

Mar 1976

**MSC-14683**

Vol 1, No 1, p 34

Optical system consists of two filter layers with each layer composed of transparent stripes alternating with dichroic color filter strips. System produces color multiplexed light signal by vertically orienting dichroic filter stripes perpendicular to scan lines of image tube

**B76-10027****SERIAL-TO-PARALLEL COLOR-TV CONVERTER**

T W Doak (Philco-Ford Corp), R B Merwin (Philco-Ford Corp), S E Zuckswert (Philco-Ford Corp), and W Sepper (Philco-Ford Corp)

Mar 1976 See also NASA-CR-141891 (N75-26203)

**MSC-14844**

Vol 1, No 1, p 35

Solid analog-to-digital converter eliminates flicker and problems with time base stability and gain variation in sequential color TV cameras. Device includes 3-bit delta modulator, two-field memory, timing, switching, and sync network, and three 3-bit delta demodulators

**B76-10028****TRACKING SYSTEM FOR MOVING SUBJECTS**

L N Mogavero, E G Johnsen (Natl Bur of Standards), J M Evans, Jr (Natl Bur of Standards), and J S Albus (Natl Bur of Standards)

Mar 1976

**HQN-10880**

Vol 1, No 1, p 36

Electronic system automatically focuses camera or spotlight on moving object. Subject is equipped with miniature ultrasonic or radio transmitter, its signal is picked up by two or more detectors, is phase detected and fed into computer which determines position of subject and sends command signals to servo for camera or spotlight

**B76-10029****READOUT METHOD FOR STORED INFORMATION**

G W Lewicki

Mar 1976

**NPO-13243**

Vol 1, No 1, p 37

Readout technique increases density of stored information for projection onto facsimile reproduction. Data stored on line structures is scanned at 90 deg angle over area larger than recorded format to ensure complete recovery of information

**B76-10160****AUTOMATIC FIRE/WEATHER DATA STATION**

H Lum, Jr

Aug 1976

**ARC-10993**

Vol 1, No 2, p 169

Prototype unmanned integrated system collects and processes fire-index data. System is based on state-of-the-art technology, utilizes low-cost hardware, and is highly reliable

**B76-10161****UNBALANCED QUADRI-PHASE DEMODULATOR**

H S Kobayashi and S P Bradfield, III

Aug 1976

**MSC-14840**

Vol 1, No 2, p 170

New demodulator for suppressed carrier pulse-code-modulated signals represents incoming signals as vectors

**B76-10162****FREE-SPACE MICROWAVE-POWER TRANSMISSION**

W C Brown (Raytheon Co)

Aug 1976

**M-FS-23443**

Vol 1, No 2, p 171

Laboratory-scale wireless transmission of microwave power approaches fifty-four percent efficiency. DC is converted to a 2.45-GHz signal and is transmitted through horn antenna array. Microwave signal is received at rectenna and is simultaneously collected and rectified back to dc at receiving sites. Dc is then processed for wired distribution

**B76-10163****LONG BINARY FRAME SYNC WORDS**

B K Levitt

Aug 1976

**NPO-13727**

Vol 1, No 2, p 172

Prefixes of pseudonoise sequences for frame-synchronization of binary PSK telemetry require only small portion of sync words to be stored in memory

**B76-10164****DEMODULATOR AIDS SYNCHRONIZATION**

M K Simon and J G Smith

Aug 1976

**NPO-13605**

Vol 1, No 2, p 172

Decision-feedback loop synchronizes multiple-amplitude and phase-shift keyed signals

**B76-10165****ANALOG-TO-BINARY CONVERSION OF VIDEO DATA**

M H Acuna and C J Pellerin

Aug 1976

**GSFC-11918**

Vol 1, No 2, p 173

Accurate and controllable technique for converting television information to binary form has been developed for systems requiring video signals to be used with automatic data-processing equipment. High-speed comparator circuit ignores out-of-focus features and is insensitive to overall brightness changes in picture

**B76-10166****DIGITAL VIDEO IMAGE SYSTEM**

P L Neely (Computer Sci Corp) and R M Brown (Computer Sci Corp)

Aug 1976

**M-FS-23322**

Vol 1, No 2, p 174

Interactive recording and display device acts as very-high-speed data-input/output interface between analog (video) signals and standard digital-computer components. System can be used



## 02 ELECTRONIC SYSTEMS

with various picture and memory sizes and can be controlled manually or by computer

### B76-10167

#### INTERACTIVE IMAGING AND DATA PROCESSING

H Alsberg, R Nathan, and J H Morecroft

Aug 1976

NPO-13655

Vol 1, No 2, p 175

Image processing method is capable of contrast enhancement, noise filtering, and photometric distortion removal in near real time. System uses digital image integration and digital video recorder as image buffer. Each frame of data is entered into memory, registers provide readout of stored TV frame.

### B76-10168

#### MULTIPLANE BINOCULAR VISUAL DISPLAY SYSTEM

W D Chase

Aug 1976

ARC-10808

Vol 1, No 2, p 176

Electro-optic system is interfaced with digital computer in flight simulator to generate simultaneous multiple-image planes in real time. System may have applications with other display and remote-control systems.

### B76-10319

#### MANCHESTER TRANSITION TRACKING LOOP (MTTL)

A Cellier (TRW, Inc.), L N Ma (TRW, Inc.), and D C Huey (TRW, Inc.)

Jan 1977

MSC-14842

Vol 1, No 3, p 343

In new tracking loop, separate phase detection algorithm is incorporated for acquisition, programmed acquisition-to-track sequence includes automatic bandwidth switching. Additionally, system has very effective phase detection signal-to-noise ratio and can operate at any rate by changing master clock frequency. All system parameters remain constant.

### B76-10320

#### INEXPENSIVE LOW-VOLTAGE SOLID-STATE ALARM

D H Hardy

Jan 1977

LEWIS-12644

Vol 1, No 3, p 344

Monitor/alarm with audio and visual warning output can be used to warn when prescribed limits of temperature, liquid level, pressure, or similar properties are exceeded. Device is more compact, lighter, and less expensive to manufacture than typical alarm circuits.

### B76-10321

#### VOLTAGE-OFFSET REDUCTION IN DATA TRANSMITTERS

C E Theall (Singer Co.)

Jan 1977

MSC-14933

Vol 1, No 3, p 345

Current source, which consists of inductor and two silicon diodes, is used to reduce output voltage offset and to make circuit less sensitive to conductance differences in output transistors.

### B76-10322

#### BINARY/BCD-TO-ASCII DATA CONVERTER

A J Miller

Jan 1977

GSFC-12044

Vol 1, No 3, p 346

Converter inputs multiple precision binary words, converts data to multiple precision binary-coded decimal, and routes data back to computer. Converter base can be readily changed without need for new gate structure for each base changeover.

### B76-10323

#### PN RANGING/TELEMETRY TRANSMISSION

L F Deerkosky

Jan 1977

GSFC-12017

Vol 1, No 3, p 347

System can transmit range-indicating pseudonoise (PN) codes and simultaneously transmit auxiliary information as binary data at a rate at least on order of pseudonoise chipping rate. PN

code is modulated by data stream with relatively low bit rate. Data stream with high bit rate can be transmitted in same frequency band as PN ranging code.

### B76-10324

#### RECEIVER PERFORMANCE EVALUATOR

J A Cusack (Motorola Inc.) and H R Meyering (Motorola Inc.)

Jan 1977

NPO-13701

Vol 1, No 3, p 348

Signal-to-noise ratio is estimated and bit errors in Manchester-encoded data streams are detected, using microprocessor-based test set.

### B76-10325

#### CONCATENATED ALGEBRAIC DECODER

Innovator not given (Raytheon Co.) Jan 1977

MSC-14058

Vol 1, No 3, p 349

Technique for manipulating digital data consists of mating two separate coding/decoding methods to produce hybrid inner-code/outer-code system. Interactive digital circuitry is used to manipulate casually related digital data.

### B76-10326

#### ORAL ANNUNCIATOR WITH PROGRAMMABLE VOCABULARY

D Paslay (Garrett Corp.) and P Wong (Garrett Corp.)

Jan 1977

MSC-14798

Vol 1, No 3, p 350

Voice (analog) signal is converted to its digital equivalent and stored in solid state memory. Upon command, memory becomes part of annunciator system which includes other digital logic, digital-to-analog converter, and audio amplifier.

### B76-10327

#### SIGNAL PROCESSING AND DISPLAY FOR ELECTROCHEMICAL DATA

R N Young and J R Wilkins

Jan 1977 See also B73-10523

LANGLEY-11922

Vol 1, No 3, p 351

Two electrochemical electrodes provide signals, apparatus automatically determines reaction end point and displays lag period in time or cell concentration. Apparatus can be used with standard pH reference anode and platinum anode or with redox electrodes.

### B76-10328

#### MICROPROGRAMMING FOR REAL-TIME DATA ACQUISITION

F J Patella (IBM)

Jan 1977

KSC-11027

Vol 1, No 3, p 352

Transmit microcode trap logic is conditioned by preset clock. Measurement request or issuance of command is controlled by set of software-initialized polling tables. Receive microcode trap logic is conditioned by transmit/receive hardware when response is returned on data bus.

### B76-10329

#### SUBCARRIER SIGNAL COMBINER FOR ARRAYED ANTENNAS

H C Wilck and R A Winkelstein

Jan 1977

NPO-13723

Vol 1, No 3, p 353

Quadrature correlation for automatic signal phasing and variable delay is used to combine signals for improved signal-to-noise ratio.

### B76-10330

#### PREVENTION OF DESIGN FLAWS IN MULTICOMPUTER SYSTEMS

J M Romberg (McDonnell-Douglas Corp.)

Jan 1977 See also NASA-CR-147657 (N76-23889)

MSC-14920

Vol 1, No 3, p 354

Report summarizes research on failure mode analysis for multicomputer systems where two or more computers may serve as redundant set. Failure modes such as data bus monopoliza-

tion, shutdown due to transients loss of control system equalization memory alteration, and software errors are discussed

**B76-10473****DIRECT-READING INDUCTANCE METER**

R B Kolbly

Mar 1977

**NPO-13792**

Vol 1, No 4, p 527

Meter indicates from 30 nH to 3 micro H Reference inductor of 15 micro H is made by winding 50 turns of Number 26 Formvar wire on Micrometal type 50-2 (or equivalent) core Circuit eliminates requirement for complex instrument compensation prior to taking coil inductance measurement and thus is as easy to operate as common ohmmeter

**B76-10474****VIDEO SIMULATOR WITH ELECTRONIC RANGING**

W Kraemer (Singer Co)

Mar 1977

**MSC-14965**

Vol 1, No 4, p 528

Gimbal orientation, raster shrinkage and deflection, and track movement are used to simulate attitude and range Key component in system is video digitizer that converts vidicon camera signal to digital form, processes it to reduce image size, and reconverts processed data to analog signal for display on cathode ray tube

**B76-10475****INFRARED RANGE SENSOR**

J W Hill (Stanford Res Inst) and J R Woodbury (Stanford Res Inst)

Mar 1977

**ARC-10885**

Vol 1, No 4, p 529

Sensor employs triangulation technique to locate objects that lie in intersections of four emitted beams of light and fields of view of four phototransistors Signals from individual phototransistors are filtered and identified by individual synchronous detectors one for each beam-intersection point

**B76-10476****IRONLESS-ARMATURE BRUSHLESS MOTOR**

R L Fisher (Sperry Rand Corp)

Mar 1977

**GSFC-11880**

Vol 1, No 4, p 530

Device uses 12-pole samarium cobalt permanent-magnet rotor and three Hall-effect sensors for commutation In prototype motor, torque constant (3-phase delta) is 65 oz-in/amp, electrical time constant (L/R) is 0.2 x 0.001 sec and armature resistance is 20 ohms

**B76-10477****FULL-COLOR HYBRID DISPLAY**

W D Chase

Mar 1977

**ARC-10903**

Vol 1, No 4, p 531

System presents realistic and properly proportioned image of runway with its associated lights as it appears at dusk or at night Display employs high resolution cathode ray tube and color wheel to produce colored lights from computer generated signals Lights are then superimposed on conventional television display of runway

**B76-10478****EFFECTS OF MISMATCH ON GROUP DELAY OF MICROWAVE TRANSMISSION**

R W Beatty and T Y Toshi

Mar 1977

**NPO-13863**

Vol 1, No 4, p 532

Calculation method can be applied to transmission lines operating in TEM mode or to single-mode propagation in waveguides Derived data are useful for estimating limits on variation of group delay with frequency or in determining how much discontinuity reduction is necessary to achieve given accuracy in predicting group delay

**B76-10479****REDUCTION OF COMPUTER POWER INTERRUPTIONS**

C C Oleson (Rockwell Intern Corp)

Mar 1977

**MSC-16136**

Vol 1, No 4, p 533

Inexpensive latching relays incorporating one-second time delay prove effective for maintaining system power in place of computer facility automatic shutdown sensors that are activated by minute power surges or spikes in 60 Hz input signal

**B76-10480****INSTRUMENTATION FOR MEASURING LOW-LEVEL CURRENTS/VOLTAGES**

R G Richmond

Mar 1977

**MSC-14855**

Vol 1, No 4, p 534

Instrumentation consists of high-output resistance voltage measuring amplifier (electrometer) and current-to-frequency converter (current digitizer) coupled to set of timers and counters Digital display of time-averaged signals with amplitudes varying over 11 decades is possible

**B76-10481****TRACKING A PHASE-SHIFT-KEYED SIGNAL**

S Villarreal, S D Lenett, H S Kobayashi and J F Pawlowski

Mar 1977

**MSC-16170**

Vol 1, No 4, p 535

In detector, phase shifter is used to generate negative phase shift opposing detected phase angle This produces converted series sideband and component carrier with residual carrier signal and converted series sideband and component carrier added together to produce tracking signal

**B76-10482****ADVANCED IMAGING COMMUNICATION SYSTEM**

E E Hilbert and R F Rice

Mar 1977

**NPO-13545**

Vol 1, No 4, p 536

Key elements of system are imaging and nonimaging sensors, data compressor/decompressor, interleaved Reed-Solomon block coder, convolutional-encoded/Viterbi-decoded telemetry channel, and Reed-Solomon decoding Data compression provides efficient representation of sensor data and channel coding improves reliability of data transmission

**B76-10483****FLEXIBLE HIGH-SPEED INSTRUMENTATION SYSTEM**

F Bartoli and R W Borek Sr

Mar 1977

**FRC-10110**

Vol 1, No 4, p 537

Remote multiplexer/demultiplexer digital instrumentation system, which is suitable to both airborne and ground-based data acquisition/process control applications can be employed in a variety of research and flight test applications where great flexibility to accommodate changes in number of parameters, data sampling rates, and signal conditioning is required

**B76-10484****INDUCTION MOTOR ANALYSIS**

G Bollenbacher

Mar 1977

**LEWIS-12687**

Vol 1, No 4, p 538

FORTTRAN program calculates torque speed characteristics electrical characteristics magnetic flux densities, and weight plus other parameters Input to program consists of physical dimensions, winding temperatures, winding description material characteristics, and electrical design parameters

## 03 PHYSICAL SCIENCES

**B76-10030****LASER EXTENSOMETER**

### 03 PHYSICAL SCIENCES

P L Stocker (Rockwell Intern Corp) and H L Marcus (Rockwell Intern Corp)  
Mar 1976

**M-FS-19259** Vol 1, No 1, p 39  
Drift-compensated and intensity-averaged laser-based system uses optical and photoelectric effects for precise measurement of small thermally-induced size changes Final output signal is directly proportional to size of sample shadow and independent of laser intensity detector dark current, and lateral motion of sample

**B76-10031**  
**LASER-DOPPLER MEASUREMENT OF AIR TURBULENCE**  
R M Huffaker  
Mar 1976

**M-FS-23155** Vol 1, No 1, p 40  
Laser-Doppler system with 10-micron wavelength tracks 1-micron dust particles to measure air turbulence System is designed for use at airports to measure and track aircraft trailing vortexes

**B76-10032**  
**IMPROVED EINZEL LENSES**  
R K Hart (Georgia Inst of Tech)  
Mar 1976

**M-FS-23115** Vol 1, No 1, p 41  
New insulator configuration simplifies construction of three-electrode electrostatic electron lenses in which center electrode is at high electrical potential Spherical sapphire insulators are used in lieu of conventional tubular ceramic or plastic insulators in Einzel lens assembly

**B76-10033**  
**STEPPING OPTICAL PATH DIFFERENCE IN AN INTERFEROMETER**  
R A Schindler  
Mar 1976

**NPO-13569** Vol 1, No 1, p 42  
Stepping method permits higher amplitude modulation of secondary mirror of Fourier interferometer Amplitude of mirror motion is limited only by available voltage drive on error-correcting actuator Closed-loop controller provides servo error voltage linearly proportional to offset from proper null position Bidirectional counter serves to count number of reference laser fringes offset from null position

**B76-10034**  
**LIGHT PIPES FOR LED MEASUREMENTS**  
S R Floyd and E F Thomas, Jr  
Mar 1976

**GSFC-11887** Vol 1, No 1, p 43  
Light pipe directly couples LED optical output to single detector Small area detector measures total optical output of diode Technique eliminates thermal measurement problems and channels optical output to remote detector

**B76-10035**  
**ELLIPSOMETER FOR MEASUREMENT IN ULTRAHIGH VACUUM**  
H U Walter, L A Wertzenkamp, and P N Peters  
Mar 1976

**M-FS-23130** Vol 1, No 1, p 44  
Ellipsometer, used with ultrahigh vacuum, allows measurement of varied angles of incidence Vacuum chamber, directly incorporated into optical bench systems, allows varied angle measurements to be taken through same region of a window

**B76-10036**  
**CALIBRATION SOURCE FOR SENSITIVE OPTICAL DETECTORS**  
B T Baugh  
Mar 1976

**LANGLEY-11625** Vol 1, No 1, p 45  
Light-emitting diode (LED), maintained near room temperature stabilizes wavelength of emitted light and calibrates photo-optical detectors

**B76-10037**  
**MEASUREMENT OF TRANSIENT REFLECTANCE**  
J M Zwiener  
Mar 1976

**M-FS-23160** Vol 1, No 1, p 46  
Real-time reflectometer, adjusted to a fraction of a second monitors transient effects and allows sample to be exposed to environment continuously Reflectance and reference signals share same optical path, minimizing extraneous effects

**B76-10038**  
**IMPROVED COLLIMATOR FOR IMAGING SYSTEM**  
A M Holladay and C T Huggins  
Mar 1976

**M-FS-22863** Vol 1, No 1, p 47  
System's collimator, consisting of metal plate with many small-diameter holes and fiber optics scintillator, can increase system resolution to 1 mm and reduce scintillation loss to 25 percent

**B76-10039**  
**HOLOGRAPHY WITH SURFACE PLASMA WAVES**  
J J Cowan (Natl Acad of Sci)  
Mar 1976

**M-FS-22040** Vol 1, No 1, p 48  
New technique utilizes reflection-type diffraction grating of type generally used in grating spectrometers Grating is coated with thin layer of high-resolution recording medium, having absorption coefficient low enough to prevent incident light absorption before it is reflected by metal layer

**B76-10040**  
**BEAM PATTERNS OF LIGHT-EMITTING DIODES**  
E F Thomas, Jr and S R Floyd  
Mar 1976

**GSFC-11890** Vol 1, No 1, p 49  
IR-sensitive film, placed at various source-to-detector distances, records output beam pattern of LED Information is then used to determine optimum position of detector surface for maximum radiation interception

**B76-10041**  
**IMPROVED INTERFEROMETER BEAM SPLITTER**  
R A Schindler  
Mar 1976

**NPO-11932** Vol 1, No 1, p 50  
Cat's-eye retroreflector attached to motor driven lead screw allows low-frequency changes in optical path Moving-coil actuator attached to other retroreflector allows mid-frequency movements High-frequency movements are achieved by employing piezoelectric transducer attached to secondary mirror of same retroreflector

**B76-10042**  
**DETERMINATION OF RADIATIVE CURRENT IN LED'S**  
E F Thomas  
Mar 1976

**GSFC-12034** Vol 1, No 1, p 51  
Directly measureable quantity of radiative output in LED's is total forward current When applied forward voltage is below 1.05 V the forward current is primarily nonradiative and varies with forward voltage as  $\exp(qV/2kT)$ , when  $q$  is the charge,  $V$  is applied voltage,  $K$  is Boltzmann's constant, and  $T$  is operating temperature

**B76-10043**  
**VOLTAGE CONTROL FOR CORONA CHARGING THERMOPLASTICS**  
R S Mezrich (RCA)  
Mar 1976

**M-FS-23102** Vol 1, No 1, p 52  
Controlled voltage is accomplished by placing metal plate with hole in it near surface of film During charging, thermoplastic will accumulate charge only until it reaches plate voltage, after that, all charge will be deflected to plate

**B76-10044****PERMANENT HOLOGRAPHIC STORAGE MEDIUM**

R A Gange (RCA)

Mar 1976

**M-FS-22588**

Vol 1, No 1, p 52

Storage unit is electrostatically-charged multilayered laminate. Ability of system to store information in holographic forms is due to specific electrical, optical, and chemical characteristics of its materials

**B76-10045****ELECTRODE STRUCTURE FOR UNIFORM CORONA DISCHARGE**

R A Gange (RCA) and C C Steinmetz (RCA)

Mar 1976

**M-FS-22617**

Vol 1, No 1, p 53

Single corona-discharge needle is used to apply uniform charge to thermoplastic medium in holograph-storage system. Needle is connected to flat transparent electrode that is parallel to thermoplastic

**B76-10046****ANAMORPHIC LENS FOR TRACKING SYSTEM**

R H Burns and L F Schmidt

Mar 1976

**NPO-13062**

Vol 1, No 1, p 54

Lens has 2:1 focal-length ratio, consists of three spherical and two cylindrical elements, and is 7.6 cm in length. When used in conjunction with image dissector tube, expected root-mean-square noise equivalent angle is approximately 8 arc seconds

**B76-10047****SOLAR SELECTIVE SURFACES**

G McDonald, R W Lauver, P Baumeister (Rochester Univ.), and A C Benning (Harshaw Chem Co)

Mar 1976

**LEWIS-12614**

Vol 1, No 1, p 55

Method consists of applying high absorptance coating onto thin film or foil of low emittance material. Thin film surface is then bonded to collector panel surface

**B76-10048****TWO-DIMENSIONAL PHOTON DETECTOR**

J G Timothy (Harvard Coll Obs) and R L Bybee (Ball Bros Res Corp)

Mar 1976

**M-FS-23326**

Vol 1, No 1, p 56

Device incorporates set of cascaded microchannel-array plates in proximity focus with two sets of mutually-orthogonal linear anodes. Technique allows data from  $N \times M$  picture elements to be recorded with only  $N + M$  amplifiers

**B76-10049****POLISHING TECHNIQUE FOR BERYLLIUM MIRROR**

J F Froechtenigt (Martin Marietta Corp)

Mar 1976

**M-FS-22923**

Vol 1, No 1, p 57

Performance tests accomplished by inserting entire X-ray telescope and polished mirror into vacuum line 67 m long and taking photographs of an X-ray resolution source indicate that polishing increases mirror efficiency from 0.06 percent for X-rays at 0.8 nm and increases resolution from 15 to 3.75 arc-seconds

**B76-10050****STANDARD AEROSOLS FOR PARTICLE VELOCIMETERS**

A Deepark, R Ozarski and J A L Thomson

Mar 1976

**M-FS-23075**

Vol 1, No 1, p 58

System consists of laser-scattering counter (LSC) and photographic system. Photographic system provides absolute method of measuring aerosol size-distribution independently of their light scattering properties. LSC comprises 1-mW He/Ne laser input optics, collecting optics, photodetector, and signal-processing electronics

**B76-10051**

Vol 1, No 1, p 58

**OPTICAL BIAS ASSEMBLY**

R Weagant (Honeywell, Inc) and N Aldrich (Honeywell Inc)

Mar 1976

**MSC-14412**

Assembly used to achieve linear response in optical detection system consists of tungsten lamp source, optical filters, fiber optics bundle, aperture mask, relay lens, and folding mirror. Tungsten lamp source provides sufficient background illumination to make input optical flux small compared to background

**B76-10052****VIDEO DISPLAY SYNTHESIZER**

C Grant (Martin Marietta Corp)

Mar 1976

**MSC-14620**

Vol 1, No 1, p 60

Dc command voltages from analog computer can be displayed as four dots and two crosshairs configured to provide illusion of depth via planar or stereo presentations in monochrome or color and if stereo using dual monitors, single monitor with split screen or single monitor with color separation

**B76-10053****MICROCHANNEL DETECTOR ARRAY FOR X-RAYS AND UV**

J G Timothy (Harvard Coll Obs) and R L Bybee (Ball Bros Res Corp)

Mar 1976

**M-FS-23324**

Vol 1, No 1, p 61

Device employs sensitive photoelectric electrodes and solid-state memory can be used at visible UV and X-ray wavelengths, includes nonmagnetic proximity focusing, and is immune to high energy charged-particle background

**B76-10054****VIDICON INTENSIFIER**

R P Carpentier (Westinghouse Elec Corp), J P Pietrzyk (Westinghouse Elec Corp), R R Beyer (Westinghouse Elec Corp), and J S Kalafut (Westinghouse Elec Corp)

Mar 1976

**NPO-11912**

Vol 1, No 1, p 62

Computer-designed sensor, consisting of single-stage electrostatically-focused triode image intensifier provides high quality imaging characterized by exceptionally low geometric distortion, low shading, and high center-and-corner modulation transfer function

**B76-10055****CALIBRATION OF IMAGE DISSECTOR TUBES**

E E Klingman, III

Mar 1976

**M-FS-22208**

Vol 1, No 1, p 63

Technique employs computer-controlled light-emitting diode (LED), precision machined mask and analog-to-digital converter (ADC). Computer turns on LED which floods masked face of tube. Intensity pattern, generated as tube is electromagnetically swept, is fed to ADC which controls tube calibration

**B76-10056****HYBRID-MODE THERMIONIC CONVERTER**

N S Rasor (Energy Res and Develop Admin) and E J Britt (Energy Res and Develop Admin)

Mar 1976

**HQN-10876**

Vol 1, No 1, p 64

Converter's collector electrode has uniform low work-function surface and operates at sufficiently low temperature to produce negligible electron emission. Emitter electrode has main region which has intermediate work-function and auxiliary region which has relatively high work-function surface

**B76-10057****CONVERT TECHNIQUE AND COMPUTER PROGRAM FOR CALCULATING PHOTOGRAPHIC FILM-DENSITY VARIATIONS**

C W Ohlhorst

Mar 1976

### 03 PHYSICAL SCIENCES

#### LANGLEY-11873

Vol 1, No 1, p 65

Binary-coded-decimal microdensitometer output is converted into number representing film-density difference between unexposed film border and any data point on photograph while also correcting for atmospheric backscattering and lens vignetting

#### B76-10169

##### DOUBLE-EXPOSURE HOLOGRAPHIC INTERFEROMETER

F R Livingston

Aug 1976

#### NPO-13796

Vol 1, No 2, p 179

Expensive optical-grade components in holographic interferometer are replaced with plastic test section and large-aperture spherical mirror to reduce distortions introduced by imperfections and cylindrical shape of plastic Instrument is used for shock-tube gas density studies and is adaptable to wind-tunnel studies of vehicle windshields and other testing

#### B76-10170

##### TWO-WAVELENGTH DYE LASER

E V Browell

Aug 1976

#### LANGLEY-12012

Vol 1, No 2, p 180

Double-pulse laser utilizes existing optical components in unique design and is used in DIAL (differential absorption LIDAR) experiments to remotely detect pollutant and trace gases in atmosphere It can be used with any double-pulsed pump laser or two single-pulse lasers that can be sequentially pulsed within short period of time

#### B76-10171

##### PHOTOREFRACTIVE PAGE COMPOSER

C M Verber (Battelle Mem Inst)

Aug 1976

#### M-FS-23419

Vol 1, No 2, p 181

Optical information-storage device is small, easy to operate, and has low optical losses Device utilizes optical system in which storage medium, a plate of photosensitive material changes its refractive index upon exposure to light Major design feature is that page-composer plate does not require complete erasure between scans

#### B76-10172

##### WIND VELOCITY MEASUREMENT

W C Cliff R M Huffaker, W K Dahm, T R Lawrence (Lockheed Missiles and Space Co) M C Krause (Lockheed Missiles and Space Co), and J S L Thomson (Phys Dyn Corp)

Aug 1976

#### M-FS-23362

Vol 1, No 2, p 182

Homodyne laser-Doppler system determines three-component wind velocity at altitudes of several kilometers in clear-air conditions There is no need for deployment of towers, radio-sondes or for seeding airflows

#### B76-10173

##### COMBINED GAAS LASER OUTPUTS

E M Rutz (IBM)

Aug 1976

#### M-FS-23397

Vol 1, No 2, p 183

Technique for combining outputs of array of small semiconductor lasers increases total output power while relaxing fabrication tolerances to make manufacture potentially less costly Advantage of free-running mode is that spacing between junction-diode lasers is less critical than for conventional, phase-coherently coupled arrays

#### B76-10174

##### AIRPORT LASER-DOPPLER

E W Coffey (Lockheed Missiles and Space Co), C E Craven (Lockheed Missiles and Space Co), B B Edwards (Lockheed Missiles and Space Co), C C Huang (Lockheed Missiles and Space Co), M C Krause (Lockheed Missiles and Space Co) T R Lawrence (Lockheed Missiles and Space Co), L K Morrison (Lockheed Missiles and Space Co), K R Shrider (Lockheed Missiles and Space Co), and D J Wilson (Lockheed Missiles and Space Co)

Aug 1976

#### M-FS-23423

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Vol 1, No 2, p 183

Laser system remotely senses and tracks aircraft-wake turbulence Other potential applications include long-range (remote) detection of airflow monitoring smokestack exit flow velocities and observing winds at altitude

#### B76-10175

##### ANALOG DATA RECORDING ON MNBI FILM

J E Guisinger and G W Lewicki

Aug 1976

#### NPO-13302

Vol 1, No 2, p 184

High coercive-force films have reduced sensitivity to wall-domain motion and can record at higher spatial frequencies Tracks switched in high coercive-force films have track widths independent of applied magnetic field Upper spatial frequency limit recorded by Curie-point switching in alternating field is greater

#### B76-10176

##### LOW-THRESHOLD LIGHT-EMITTING-DIODE LASER

F Z Hawrylo (RCA) and H Kressel (RCA)

Aug 1976

#### LANGLEY-11477

Vol 1, No 2, p 185

Technique, which consists of reducing bandgap change at heterojunction to 0.1 eV and avoiding deep-level impurities such as Si and Ge, produces low-threshold laser diodes which are made from (AlGa)As and emit in visible spectrum

#### B76-10177

##### BEAM SPLITTER/COMBINER

W Leeb (Natl Res Council)

Aug 1976

#### GSFC-12083

Vol 1, No 2, p 186

Device uses total internal reflection in wedge configuration to avoid interference caused by unwanted, stray reflected beams and is particularly suited for laser heterodyne systems uses in communications, radar, radiometry and spectroscopy

#### B76-10178

##### OPTICAL ALINEMENT SYSTEM

N L Thomas (Lockheed Missiles and Space Co)

Aug 1976

#### ARC-10932

Vol 1, No 2, p 187

Technique allows geometric center of light source, such as sun laser, or solar simulator, to be aligned with mirror quickly and in daylight Source is aligned by precisely superimposing colored images of source, as viewed along two different paths

#### B76-10179

##### FIELD DISTRIBUTION IN A THIN LENS

C H Chi (Perkin-Elmer Corp)

Aug 1976

#### LANGLEY-11392

Vol 1, No 2, p 188

Quasi-optical formulation gives an optical field distribution by computing only two terms First term represents geometrical optics effect, and second term represents diffraction effect, thus mathematical expression is simplified, and considerable computer time is saved

#### B76-10180

##### SIMPLIFIED DEFLECTION-COIL LINEARITY TESTING

G P Kramer (Sperry Rand Corp)

Aug 1976

#### M-FS-23400

Vol 1, No 2, p 189

Mask placed over face of image-dissecting photomultiplier tube has precision array of pinholes that permit light to impinge on tube at known points Signals are fed to deflection coil which sweeps beam across each point without complex operator procedures

#### B76-10181

##### CONTRAST ENHANCEMENT OF TRANSPARENCIES

A R Shulman and S H Lee (California Univ)

Aug 1976

#### GSFC-11989

Vol 1, No 2, p 190

System can enhance or reduce contrast of photographic transparency for printing or projection by using constructive and destructive interference of collimated laser beam. System is potentially less expensive than electronic CRT methods and is more accurate than trial-and-error manual techniques

**B76-10182**

**FACETED SOLAR ENERGY COLLECTORS**

D R Segna

Aug 1976

**MSC-12687**

Vol 1, No 2, p 191

Two concepts enhance efficiency and flexibility of solar collectors: faceting collector surface and adding coloring agent to working fluid. Collector can be placed on existing structures and oriented to take advantage of position of sun. By adding coloring agent to working fluid, total absorbance can be increased and altered if required.

**B76-10183**

**DOUBLE-FOCUSING MASS SPECTROMETER**

C E Giffin, A O Nier, and L M Sieradski

Aug 1976

**NPO-13663**

Vol 1, No 2, p 192

Device uses lighter, easily aligned, magnet assembly to provide field required to interact with ion beam. It has no separate duct; instead, evacuated duct is formed by pole pieces which support vacuum pump. Magnetic gap and magnet assembly are reduced from 4.64 to 2.54 mm and from 2.4 to 1.5 kg, respectively.

**B76-10184**

**LOW-REFLECTIVITY SPECTRALLY SELECTIVE COATING**

J J Zaniewski and H Herzog

Aug 1976

**GSFC-12114**

Vol 1, No 2, p 193

Mirror, with area of low reflectivity, replaces neutral-density transmission filter in star-tracking system, increasing reliability. It may have applications in other optical systems.

**B76-10185**

**PULSE TRANSFORMER FOR GAAS LASER**

E M Rutz (IBM)

Aug 1976

**M-FS-23399**

Vol 1, No 2, p 194

High-radiance gallium arsenide (GaAs) laser operating at room temperature is utilized in optical navigation system. For efficient transformer-to-laser impedance match, laser should be connected directly to pulse transformer secondary winding.

**B76-10186**

**SOLAR THERMAL ENERGY UTILIZATION: A BIBLIOGRAPHY WITH ABSTRACTS**

Innovator not given (New Mexico Univ.) Aug 1976

**HQN-10900**

Vol 1, No 2, p 195

Bibliographic series, which is periodically updated, cites documents published since 1957 relating to practical thermal utilization of solar energy. Bibliography is indexed by author, corporate source, title, and keywords.

**B76-10187**

**OPTICS AND LASERS**

Innovator not given Aug 1976 See also NASA-SP-5973(03)

**HQN-10893**

Vol 1, No 2, p 195

Report describes twenty-seven optical concepts developed for holographic viewing, spectral transmission, and film camera technology. Articles include developments in laser-Doppler systems, laser beam deflection controls, X-ray photography, and camera components.

**B76-10188**

**OPTICAL DEVICES**

Innovator not given Aug 1976 See also NASA-SP-5965(01)

**HQN-10891**

Vol 1, No 2, p 196

Report describes thirty concepts and techniques developed for optical instrumentation and light transmission and generation, including spectrometer components, telescopes and microscopes, and holographic cameras.

**B76-10189**

**HYDROGEN ENERGY: A BIBLIOGRAPHY WITH ABSTRACTS**

Innovator not given (New Mexico Univ.) Aug 1976

**HQN-10898**

Vol 1, No 2, p 196

Bibliographic series cites documents relating to use of hydrogen as energy carrier. In addition to cumulative volume, annual supplement is available for 1974, and quarterly update program serves 1975 and current calendar year.

**B76-10190**

**SANDTRACKS: WORLD MAP AND STATIONS PREDICTIONS: COMPUTER PROGRAMS**

R J Sandifer

Aug 1976

**GSFC-12099**

Vol 1, No 2, p 196

Computer program computes time history of subsatellite point and visibility from station to given satellite by integrating given epoch state.

**B76-10331**

**LASER PARTICULATE SPECTROMETER**

B A Boyd (McDonnell-Douglas Corp.) R M F Linford (McDonnell-Douglas Corp.) and R J Schmitt (McDonnell-Douglas Corp.)

Jan 1977 See also NASA-CR-144375 (N75-29407)

**MSC-14969**

Vol 1, No 3, p 357

Hybrid laser scattering and extinction technique measures particle diameters from 0.8 to 2.75 micrometers and speeds from 0.2 to 20 m/s. Operating pressures range from ambient to ultra-high vacuum, and temperatures range from 77 to 300 K. Potential applications include air pollution, clean room, and particle size monitoring.

**B76-10332**

**ECONOMICAL MEASUREMENT OF PARTICLE CONCENTRATION**

W R McCluney

Jan 1977

**GSFC-12088**

Vol 1, No 3, p 358

Meter utilizes three optical systems to detect light scattered by particles in hydrosol at 2 deg and 90 deg simultaneously. Device has capability to detect relative amounts of organic and inorganic contaminants and, with proper calibration, to measure contribution of various species to changes in contamination levels in liquid mediums.

**B76-10333**

**PINHOLE DIFFRACTION FILTER**

B E Woodgate

Jan 1977

**GSFC-12120**

Vol 1, No 3, p 359

Multistage diffraction filter consisting of coaligned series of pinholes on parallel sheets can be used as nondegradable UV filter. Beam is attenuated as each pinhole diffracts radiation in controlled manner into divergent beam, and following pinhole accepts only small part of that beam.

**B76-10334**

**A FORWARD-SCATTER POLARIMETER FOR CHEMICAL ANALYSIS**

A L Fymat

Jan 1977

**NPO-13756**

Vol 1, No 3, p 360

Photopolarimeter measures two states of orthogonal polarization: parallel and perpendicular to scattering plane, defined by directions of incident and scattering light, to determine effective gaseous depolarization factor. Instrument can be used for environmental spectroscopic and meteorological analysis.

**B76-10335**

**STABILIZED ND YAG LASER OUTPUT**

J Osmundson

Jan 1977

**GSFC-11571**

Vol 1, No 3, p 361

Stabilization system consists of feedback-loop-controlled

## 03 PHYSICAL SCIENCES

piezoelectric crystal to one of the reflectors to vary optical path length within laser cavity. Average second harmonic of fundamental 1.06 micrometer laser radiation is detected by integrating detector

**B76-10336**

### VACUUM-ULTRAVIOLET REFLECTOMETER

T H Allen (McDonnell-Douglas Corp.), C F Dillow (McDonnell-Douglas Corp.) and R M F Linford (McDonnell-Douglas Corp)  
Jan 1977

**MSC-14995**

Vol 1, No 3, p 362

Baffle, three-blade chopper, and split spherical mirror transmit alternating dual beam into integrating sphere. Alternating reference and sample beams are detected by high gain photomultiplier and modified logarithmic ratio meter. Device is useful in fusion research, high power laser work and spectrometer or monochromator construction

**B76-10337**

### EXTERNAL HEATER FOR CRYOGENIC VESSELS

G J Wennagel (Grumman Aerospace Corp.)

Jan 1977

**MSC-14056**

Vol 1, No 3, p 363

When used in conjunction with nitrogen purge system, external heating film increases gas temperature, thereby preventing chilling of equipment. Proposed system includes vacuum-deposited layer of gold sandwiched between two layers of Mylar which act as carrier for film and prevent damage

**B76-10338**

### OPTICAL PROFILOMETER

E E Burcher, W L Kelly, IV and S J Katzberg

Jan 1977

**LANGLEY-11869**

Vol 1, No 3, p 364

Device, consisting of optical scanning subsystem, two light detectors with associated amplifiers, analog divider, and adjustable nonlinear function generator, directly determines surface area, absolute depth, and point-to-point distance of three-dimensional object without physical contact with surface under observation

**B76-10339**

### SELF-CALIBRATING RADIOMETER

J Dimeff

Jan 1977

**ARC-10811**

Vol 1, No 3, p 365

Instrument has differential thermocouples that measure temperature on two sides of receiver, one side is heated by absorbed radiation, the other by resistance heater. By measuring energy required to heat back surface, amount of energy absorbed on front may be determined

**B76-10340**

### TUNABLE ACOUSTICAL OPTICAL FILTER

A L Lane

Jan 1977

**NPO-13640**

Vol 1, No 3, p 366

Solid state filter with active crystal element increases sensitivity and resolution of passive and active spectrometers. Filter is capable of ranging through infrared and visible spectra, can be built as portable device for field use, and is suitable for ecological surveying, for pollution detection and for pollutant classification

**B76-10341**

### EFFICIENT COPPER-VAPOR PULSED LASER

G R Russell, N M Nerheim, and T J Pivrotto

Jan 1977

**NPO-13449**

Vol 1, No 3, p 367

High velocity flow is attained within system by expanding heated mixture of copper vapor, argon and helium through supersonic nozzle. Arc heater, operated on argon/helium mixture, supplies energy to vaporize copper and to produce high temperature supersonic flow of gas/vapor mixture

**B76-10342**

### MEASURING SCATTER ANGLE FROM MIRRORS

Innovator not given (Perkin-Elmer Corp.) Jan 1977

**M-FS-23421**

Vol 1, No 3, p 368

Two instrumentation systems are used to measure scatter angle. Intensity scatterometer makes small angle measurements on order of 10 arc-minutes. Amplitude scatterometer which uses interferometric principle measures smaller angles on order of 10 arc-seconds. Both scatterometers use laser sources and can measure into ultraviolet (0.325 micron) wavelengths

**B76-10343**

### HOLOGRAM-RECONSTRUCTION SIGNAL ENHANCEMENT

R S Mezrich (RCA)

Jan 1977

**M-FS-23104**

Vol 1, No 3, p 369

Principle of heterodyne detection is used to combine object beam and reconstructed virtual image beam. All light valves in page composer are opened and virtual-image beam is allowed to interfere with light from valves

**B76-10344**

### MINIATURE CARBON DIOXIDE SENSOR

J Bordeaux (Beckman Instr., Inc.) and B D Henderson (Beckman Instr., Inc.)

Jan 1977

See also NASA-CR-144508 (N75-33375)

**MSC-16009**

Vol 1, No 3, p 370

Infrared absorption spectrometer with dual wave length monochromator has several valuable features: 3.4 by 1.6 inch size, accuracy within plus or minus 5% from 0 to 30 mm Hg, instantaneous and temperature-independent response time, negligible O<sub>2</sub> and N<sub>2</sub> effects and less than 0.5% water vapor effect, 2.5 W power consumption, no moving parts, and 1.5 and 30 mm Hg CO<sub>2</sub> in range

**B76-10345**

### MONITOR FOR OPTICAL-WINDOW CONTAMINATION

L N Harnett (TRW, Inc.)

Jan 1977

**ARC-10947**

Vol 1, No 3, p 371

System uses window itself as principal element of well-known attenuated total reflection technique frequently used for spectroscopic analysis of thin films. Monitor includes notch in monitored window, which acts as beam splitter to reflect portion of light at less than critical angle and causes total internal reflection

**B76-10346**

### COLOR TO BLACK-AND-WHITE CONVERTER

W E Perry

Jan 1977

**MSC-12618**

Vol 1, No 3, p 372

Lanthanum-modified lead zirconate titanate ceramic plate, when sandwiched between pair of conventional light polarizers, forms electrically controlled converter for television camera. Assembly can be used with camera at remote site to enable camera to transmit color or black and white signal on command

**B76-10347**

### LOW-LIGHT-LEVEL INTEGRATING VIDEO SYSTEM

B J Duncan, T D Fay, E R Miller, W Wamsteker, R M Brown (Computer Sci. Corp.), and P L Neely (Computer Sci. Corp.)

Jan 1977

**M-FS-23288**

Vol 1, No 3, p 373

System consists of television camera using 25 mm SEC vidicon, low dispersion spectrograph, and digital video image system used for buffer storage of video data during tube readout scanning. Six-bit ADC converts video to digital data which are stored on magnetic tape for future evaluation

**B76-10348**

### SHADOW MASK FOR X-RAY SPECTROMETER

B E Woodgate

Jan 1977

**GSFC-12131**

Vol 1, No 3, p 374

Imaging technique may be used in series with flat or conical Bragg crystals to separate spatial/spectral convolution when spectrometer is scanned across extended source emitting at

more than one wavelength. Technique allows line direction and continuum to be detected and provides data for spatial mapping of source

**B76-10349**

**QUARTZ-CRYSTAL-OSCILLATOR HYGROMETER**

R Kruger

Jan 1977

**GSFC-12153**

**Vol 1, No 3, p 375**

Measuring device, which eliminates complex and expensive optical components by electronically sensing dewpoint of water vapor in gas, employs piezoelectric crystal oscillator, supportive circuitry, temperature regulators, and readout

**B76-10350**

**TERRESTRIAL PHOTOVOLTAIC MEASUREMENTS WORKSHOP**

Innovator not given Jan 1977 See also NASA-TM-X-71802 (N76-71615)

**LEWIS-12643**

**Vol 1, No 3, p 375**

Workshop proceedings review basic methodology for measurements and calibration of solar cells. Also included are decisions concerning interim method for terrestrial solar cell measurements in order that results may be correlated between organizations doing solar cell research

**B76-10351**

**WING CALCULATING LIGHTNING-INDUCED VOLTAGES IN ELECTRICAL CIRCUITS WITHIN AN AIRCRAFT WING**

J A Plumer (GE)

Jan 1977

**LEWIS-12108**

**Vol 1, No 3, p 376**

Computer program based on Biot-Savart and Faraday laws utilizes model of generalized aircraft wing to calculate resistive and inductive transfer impedances relating lightning current flowing through wing to voltage induced in conductor within wing

**B76-10485**

**ENERGY CONVERSION SYSTEM**

C G Miller

Mar 1977 See also B75-10314

**NPO-13510**

**Vol 1, No 4, p 541**

Scheme based on chemical decomposition and recombination converts energy collected at relatively low temperatures (300 C) to higher temperatures required for efficient operation of steam-driven electrical generators. Approach uses one or more cyclical reversible chemical reactions in which compound is made to decompose and absorb thermal energy at low temperature by shifting equilibrium

**B76-10486**

**IMPROVED SOLAR-ENERGY COLLECTOR**

M K Selcuk

Mar 1977

**NPO-13813**

**Vol 1, No 4, p 542**

Fixed, but reversible, concentrator with vacuum tube receiver is fabricated from individual asymmetrical vee-shaped members having two sides, each of which presents different preselected slope angle to sun. Trough concentrator maintains year-round concentration factor of 2 (or better) for most significant collection period of day

**B76-10487**

**ELECTROSTATIC-DISCHARGE IGNITION**

J B Stephens and C G Miller

Mar 1977

**NPO-13798**

**Vol 1, No 4, p 543**

Electrode in cylinder permits charge to transfer during top dead center compression stroke in modified Otto-cycle engine. Charge transfer produces spark which causes ignition of droplets without resorting to other ignition devices which are incapable of igniting ultralean mixtures

**B76-10488**

**HYDROFOIL CONTROLS OUTFALL EFFLUENTS IN RIVERS AND OCEANS**

R C Costen

Mar 1977

**LANGLEY-12045**

**Vol 1, No 4, p 545**

System, which consists of vertical semispan hydrofoil anchored in water bed and set at angle of attack with respect to ambient water flow, works by keeping pollutants concentrated within long trailing vortex generated by hydrofoil and either deflecting vortex away from sensitive regions or sweeping it from side to side for rapid dispersion

**B76-10489**

**PORTABLE, WIND SENSITIVE, DIRECTIONAL AIR SAMPLER**

J N Deyo, R B King, and J Toma

Mar 1977 See also NASA-TM-X-71687 (N75-19623)

**LEWIS-12743**

**Vol 1, No 4, p 546**

Air Scout unit has preset timer that controls length of time filter slides are in sampling position. At end of sampling period, fresh slide is automatically moved into position and exposed filter is displaced into storage compartment. Device may be set up, loaded, programmed and left to acquire samples automatically

**B76-10490**

**REMOTE SENSING OF VEGETATION AND SOIL**

J B Schutt and S O Auer (NAS)

Mar 1977

**GSFC-11976**

**Vol 1, No 4, p 547**

Microwave ellipsometry apparatus reflects circularly polarized train of microwaves from vegetation at predetermined angle of incidence to determine ratio of intensities of electric field components and their phase differences. Refractive index given by water content of vegetation and thickness of vegetation layer are computed from formula based on Maxwell's equations

**B76-10491**

**PORTABLE SOLAR RADIOMETER MEASURES STACK-PLUME EFFLUENTS**

R J Exton and R W Gregory

Mar 1977 See also NASA-TN-D-8182 (N76-26718)

**LANGLEY-12123**

**Vol 1, No 4, p 548**

Radiometer features two optical arrangements: easy-to-align pointing optical system that is boresighted to second radiometric optical system which utilizes four filters to select wavelengths. Four channel device uses Sun as background source and measures attenuation of solar radiation through plume

**B76-10492**

**REMOTE MOISTURE-CONTENT BALANCE**

R A Blomseth, H Lum Jr., and Y Matsumoto

Mar 1977

**ARC-11032**

**Vol 1, No 4, p 549**

Automatic balance monitors wetness of wood samples to determine forest fire hazards. Fuel model consists of four wooden dowels that will absorb precipitation moisture and humidity at rate related to moisture absorption by forest wood. Model wetness is determined from weight changes as monitored by electronic balance

**B76-10493**

**DATA SYSTEM FOR MULTIPLEXED WATER-CURRENT METERS**

C R Ramsey (GE)

Mar 1977

**M-FS-23343**

**Vol 1, No 4, p 550**

Flow rates at 32 flood plain locations are measured simultaneously by single digital logic unit with high noise immunity. Water flowing through pygmy current meters rotates element that closes electrical contact once every revolution, so flow rate is measured by counting number of closures in time interval

**B76-10494**

**DIFFERENTIAL-OPTOACOUSTIC ABSORPTION DETECTOR**

M S Shumate

Mar 1977

**NPO-13769**

**Vol 1, No 4, p 552**



### 03 PHYSICAL SCIENCES

Two-cell spectrophone detects trace amounts of atmospheric pollutants by measuring absorption coefficients of gases with various laser sources. Device measures pressure difference between two tapered cells with differential manometer. Background signal is reduced by balanced window heating and balanced carrier gas absorption in two cells.

#### **B76-10495 IMAGE INTENSIFICATION OF DEVELOPED PHOTOGRAPHS**

B S Askins

Mar 1977

**M-FS-23461**

Vol 1, No 4, p 553

Autographic technique intensifies image on developed film using organic sulfur compound. Organic sulfur compound combines with silver on original film. Beta emission of compound exposes new film. Technique is less time consuming and safer than existing methods.

#### **B76-10496 SOLVENT FOR 1-PHENYL-3-PYRAZOLIDONE IN PHOTOGRAPHY**

A R Shulman, R Shaffer (Computer Sci.-Technicolor Associates), and E L Shulman

Mar 1977

**GSFC-11992**

Vol 1, No 4, p 553

Dimethyl sulfoxide is shown to be capable of dissolving silver halide developers.

#### **B76-10497 DC DRIVE SYSTEM FOR CINE/PULSE CAMERAS**

R H Gerlach, J T Sharpsteen (Perkin-Elmer Corp.), C D Solheim (Perkin-Elmer Corp.), and L J Stoap (Perkin-Elmer Corp.)

Mar 1977 See also NASA-CR-147535 (N76-22510), NASA-CR-147759 (N76-25538)

**MSC-16085**

Vol 1, No 4, p 554

Camera-drive functions are separated mechanically into two groups which are driven by two separate dc brushless motors. First motor, a 90 deg stepper, drives rotating shutter, second electronically commutated motor drives claw and film transport. Shutter is made of one piece but has two openings for slow and fast exposures.

#### **B76-10498 ELIMINATION OF COLOR RINGS ON FILM NEGATIVES**

C M Fleetwood, Jr., S H Rice, and R S Spencer

Mar 1977

**GSFC-12110**

Vol 1, No 4, p 555

Abrasive grinding of glass surface, using grinding-grit size of 22.5 micron, prevents formation of interference ring during photoprocessing. To polish irregularities for improved light transmission, contact surface is bathed in aqueous solution of sulfuric acid and hydrofluoric acid.

#### **B76-10499 HIGH-RESOLUTION ELECTRON MICROSCOPE**

R Nathan

Mar 1977

**NPO-13811**

Vol 1, No 4, p 556

Employing scanning transmission electron microscope as interferometer, relative phases of diffraction maximums can be determined by analysis of dark field images. Synthetic aperture technique and Fourier-transform computer processing of amplitude and phase information provide high resolution images at approximately one angstrom.

#### **B76-10500 SPATIALLY-COHERENT COUPLED SEMICONDUCTOR LASERS**

E M Rutz (IBM)

Mar 1977

**M-FS-23396**

Vol 1, No 4, p 557

External cavity for monolithic array of three GaAs lasers phase-coherently couples individual outputs to produce single spatially coherent beam. Fourier-transform properties of lens and spatial filter are used to select coherent mode.

#### **B76-10501**

##### **SPATIAL FILTER FOR Q-SWITCHED LASER**

L O Heflinger (TRW, Inc.) and R F Wuerker (TRW, Inc.)

Mar 1977 See also NASA-CR-121264 (N74-18152)

**LEWIS-12164**

Vol 1, No 4, p 558

Set of compound lenses reduces ionization and sparks that frequently occur around pinhole aperture in spatial filter. Lens system produces astigmatic focus near pinhole, reducing energy level there below ionization threshold.

#### **B76-10502**

##### **SERVO CORRECTS INTERFEROMETER-MIRROR TILT**

R A Schindler

Mar 1977

**NPO-13687**

Vol 1, No 4, p 559

Three detectors sense He-Ne laser beam, one senses reference phase while others, at right angles to first, sense phase offset for each axis. Analog output of axis detectors is multiplied separately by reference output to give X and Y error signals that are then fed to respective X and Y actuators.

#### **B76-10503**

##### **TEMPERATURE REFERENCE FOR MICROWAVE RADIOMETER CALIBRATION**

A W Love (Rockwell Intern Corp.), M J Vanmelle (Rockwell Intern Corp.), A C Jones (Rockwell Intern Corp.), and W N Hardy (Rockwell Intern Corp.)

Mar 1977

**LANGLEY-11355**

Vol 1, No 4, p 561

New temperature reference avoids need to physically remove antenna and replace it with calibrating termination. Device is piece of porous microwave absorber fitted with cap of nonporous plastic foam. Absorbent material is soaked with cryogen. Procedure ensures that temperature at which microwaves are absorbed is exactly that of cryogen.

#### **B76-10504**

##### **X-RAY SENSITIVE OBLIQUE IMAGING DEVICE**

K L Hallam and C B Johnson (Bendix Corp.)

Mar 1977 See also B73-10255

**GSFC-11935**

Vol 1, No 4, p 562

Instrument employs light reflecting surface (evaporated aluminum coating or minor substrate) behind phosphor screen to improve effective quantum efficiency in dual process fraction of incoming X-rays are converted to photoelectrons at photocathode, and X-rays that pass through photocathode and thin X-ray transparent membrane enter phosphor screen.

#### **B76-10505**

##### **DUAL-PURPOSE HOLOCAMERA**

L O Heflinger (TRW, Inc.) and R F Wuerker (TRW, Inc.)

Mar 1977 See also NASA-CR-121264 (N74-18152)

**LEWIS-12166**

Vol 1, No 4, p 563

Camera utilizes same basic structure to record bright-field holograms (single and double exposure interferograms) or, with minor adjustments, record forward scattered light holograms. Components that must be interchanged to convert camera can be mounted on sliding plate.

#### **B76-10506**

##### **MAGNIFYING IMAGE INTENSIFIER**

J Vine (Westinghouse Elec Corp.)

Mar 1977

**GSFC-12010**

Vol 1, No 4, p 564

Coil assembly for zoom operation produces axial magnetic flux density that decreases in strength from photocathode to target. This results in magnification factor greater than unity. To extend magnification range, field is reversed in direction between object and image planes.

#### **B76-10507**

##### **DEVELOPMENT EPHEMERIS NUMBER 96**

M S W Keesey, X X Newhall, and E M Standish, Jr

Mar 1977

**NPO-14002**

Vol 1, No 4, p 565

Program tape contains two files. file one contains all software.

necessary to create binary file and perform ephemeris calculation on that file, file two of distributed tape contains encoded ephemeris data. These data are essentially a blocked listing of complete dump of original binary tape with double precision data modified to special form

**B76-10508**  
**MULTISPECTRAL-SCANNER IMAGE PROCESSING**

M I Stein  
Mar 1977

**GSFC-12135** Vol 1, No 4, p 566

QUIKLOOK program performs approximate geometric and radiometric corrections of LANDSAT multispectral-scanner digital data and calculates Earth rotation (skew) correction from format center latitude as given by annotation record of LANDSAT bulk computer-compatible tapes

**B76-10509**  
**MULTIDIMENSIONAL HEAT CONDUCTION**

T C Connors, Jr (Rockwell Intern Corp) and L W Fesler (Rockwell Intern Corp)  
Mar 1971

**MSC-16159** Vol 1, No 4, p 566

Computer program computes transient temperature history or steady state solution for complex body geometries in three geometries. Program allows option of four methods of solution: forward difference method, midpoint difference (Crank-Nicholson) method, backward difference method, and alternating direction technique

**B76-10510**  
**GEODETTIC CONTROL NET**

M E Davies (Rand Corp)  
Mar 1977

**NPO-13718** Vol 1, No 4, p 566

Computer program, originally developed for Mariner flyby missions, computes planetary control net from measurements of topographical features identified on television pictures. Program solves for areocentric coordinates of 115 surface points and orthogonal camera matrices of 57 far and near encounter pictures

**B76-10511**  
**ANALYSIS OF LASER HETERODYNE COMMUNICATIONS**

S Cohen, S H Brewer (Hughes Res Labs), and T A Nussmeier (Hughes Res Labs)

Mar 1977

**GSFC-12098** Vol 1, No 4, p 567

Computer program, which predicts effects of optical aberrations on transmitters and receivers, includes effects of Gaussian pupil functions and utilizes algorithm that permits specification of number and location of output points for computed spread function results

**B76-10512**  
**ACTIVE OPTICS SIMULATION SYSTEM**

Innovator not given (Perkin-Elmer Corp) Mar 1977

**LANGLEY-12104** Vol 1, No 4, p 567

Set of three major computer program packages aids design of mirror control system for large telescopes. It can be used to evaluate merit of particular active optics control system (or component subsystem), and once system configuration is chosen, it can be used as design aid to optimize system parameters

**B76-10513**  
**DIGITAL IMAGE-RECTIFICATION SYSTEM**

P H VanWie, M I Stein, E Puccinelli, and B Fields  
Mar 1977

**GSFC-12156** Vol 1, No 4, p 568

System removes spatial distortions from data and brings data into conformance with Universal Transverse Mercator map projection, produces digital output products suitable for further machine processing and analysis, and fills need for geometrically corrected LANDSAT multispectral scanner digital data in several remote sensing application areas

## 04 MATERIALS

**B76-10058** Vol 1, No 1, p 57

**NOVEL AMINOBENZYL AND IMIDOBENZYL BENZENES**

V L Bell, J R Pratt (Southern Mississippi Univ), and B L Stump (Virginia Commonwealth Univ)

Mar 1976

**LANGLEY-11843**

Compounds are useful as intermediates for several classes of polymers. Amines can function as cross-linking agents for epoxide and urethane polymers, as well as intermediates for synthesis of thermally-stable addition-type polyimides. Imide derivatives can be obtained by reacting amines with certain monoanhydrides containing olefinic unsaturation

**B76-10059**  
**ATMOSPHERIC PARTICLE SAMPLER**

C G Miller and J B Stephens

Mar 1976

**NPO-13396** Vol 1, No 1, p 68

Positive and/or negative pressure is used to trap airborne particles against a filter. Positive pressure is provided by low molecular weight gas (He or H<sub>2</sub>) to achieve high particle velocity and high capture percentage. Trapped particles are examined under electron microscope

**B76-10060**  
**CONTINUOUS HCL IN AIR INDICATOR**

R E Bartera and C G Miller

Mar 1976

**NPO-13474** Vol 1, No 1, p 69

Steady stream of air is drawn into system and passes between light source and photocell. Incoming gases are sprayed with ammonia forming white cloud of NH<sub>4</sub>Cl if any HCl is present

**B76-10061**  
**THERMAL FATIGUE-AND-OXIDATION-RESISTANT ALLOY**

P T Bizon, W J Waters, and D A Spera

Mar 1976. See also B76-10062, NASA-TN-D-3597 (N66-34938), NASA-TN-D-8071 (N75-33429)

**LEWIS-12564** Vol 1, No 1, p 70

Cast nickel-base alloy designated as NASA TAZ-8A has been developed for use in high temperature aircraft engine components. TAZ-8A composition is 8Ta, 6Cr, 6Al, 4Mo, 4W, 2Cb, 0.5Zr, 0.125C, 0.004B and balance Ni (weight percent). Its specific gravity at room temperature is 8.65

**B76-10062**  
**COMPARATIVE THERMAL FATIGUE RESISTANCE**

P T Bizon and D A Spera

Mar 1976. See also B76-10061, NASA-TN-D-8071 (N75-33429)

**LEWIS-12563** Vol 1, No 1, p 71

Nineteen cast nickel-base alloys, five cast cobalt-base alloys, and two wrought nickel-base alloys are included in study. Five nickel-base alloys have directionally-solidified polycrystalline grain structure. Three diffusion coatings and vapor-deposited overlay coating are also included in investigation

**B76-10063**  
**HYDROGEN CHLORIDE TEST SET**

G L Workman (Athens Coll)

Mar 1976

**M-FS-23357** Vol 1, No 1, p 73

Detector uses tertiary amine, which makes reaction fairly specific for relatively small highly polarized hydrogen chloride molecule. Reaction is monitored by any microbalance capable of measuring extremely small mass differences in real time

**B76-10064**  
**THERMAL INSULATION FOR HIGH-TEMPERATURE SYSTEMS**

A J Parker (Hittman Associates, Inc)

## 04 MATERIALS

Mar 1976

**GSFC-10954**

Vol 1, No 1, p 74

Forty layers of 0.00064 cm platinum foil sprayed with zirconium during assembly, comprise laminated insulation with microquartz felt set into corners

**B76-10065**

**POLYMERIC FOAMS STABLE AT HIGH TEMPERATURES**

S R Riccitiello, E S Harrison (Whittaker Corp.), and C B Delano (Whittaker Corp.)

Mar 1976

**ARC-11008**

Vol 1, No 1, p 75

Crosslinked poly(N-arylenebenzimidazoles) are stable up to 370 C. Polymers are made by mixing appropriate stoichiometric amounts of tetramine and aromatic dicarboxylic acid anhydride with phenol or alkyl-substituted phenol

**B76-10066**

**TRANSPARENT AND FLAME-RETARDANT POTTING COMPOUNDS**

S L Lieberman (Furane Plastics, Inc.)

Mar 1976 See also NASA-CR-134234 (N74-21159), NASA-CR-134235 (N74-21160), NASA-CR-134236 (N74-21161), NASA-CR-134237 (N74-21162)

**MSC-14669**

Vol 1, No 1, p 76

Potting compounds include series of modified silicone RTV polymers and series of coreacted epoxy urethanes. Special properties are obtained by including Br, P, and N in polymeric structure

**B76-10067**

**COATINGS FOR MULLITE INSULATION**

P N Bolinger (GE) and H W Rauch, Sr (GE)

Mar 1976

**LANGLEY-11150**

Vol 1, No 1, p 76

Series of coatings provides hard, impermeable, waterproof layer. Inclusion of color oxides imparts high emittance to surface. Refractory fillers investigated include TiO<sub>2</sub>, BaO ZrO<sub>2</sub>, SrO TiO<sub>2</sub> zircon, spodumene, petalite, and kryptonite. Colorants include Cr<sub>2</sub>O<sub>3</sub>, NiO, and CoO

**B76-10068**

**SPECIFIC-ION ELECTRODES FOR MEASURING AG IONS**

J L Day and J M Walsh (Beckman Instr., Inc.)

Mar 1976

**MSC-14906**

Vol 1, No 1, p 77

Migration of aqueous solutions through electrode pellet, and thus corrosion of soldered connection, is prevented by coating pellet and silver wire attachment with silver-conductive epoxy

**B76-10069**

**REDUCTION OF ACOUSTIC LOSSES BY OUTGASSING**

E H Cirlin (Rockwell Intern Corp.), R M Housley (Rockwell Intern Corp.), and B R Tittmann (Rockwell Intern Corp.)

Mar 1976

**MSC-15985**

Vol 1, No 1, p 77

Heat treatment procedure at low pressure increases internal-friction quality factor of treated samples. Method can reduce propagation losses in porous ferroelectric ceramics by as much as a factor of 100

**B76-10070**

**REDOX - ELECTROCHEMICAL ENERGY STORAGE**

M Warshaw, L O Wright, and L A Thaller

Mar 1976 See also NASA-TM-X-71540 (N74-21688), NASA-TM-X-71805 (N75-32593)

**LEWIS-12220**

Vol 1, No 1, p 78

Rechargeable system, which operates at relatively low temperatures from room temperature to about 353 K, consists of analyte and catholyte storage tanks connected to flow cell

**B76-10071**

**PASSIVE THERMAL-CONTROL COATINGS**

T K Mookherji (Teledyne Brown Eng.) and J D Hayes (Teledyne Brown Eng.)

Mar 1976

**M-FS-22794**

Vol 1, No 1, p 79

Design engineer's handbook discusses passive temperature control techniques: selection of control surfaces and environmental damage mechanisms

**B76-10072**

**HANDBOOK OF LIQUID METALS**

A O Ukanwa (Howard Univ.)

Mar 1976

**M-FS-23355**

Vol 1, No 1, p 79

Metals are described by physical appearance followed by atomic weight, atomic number, and valence. Data include laboratory handling and safety procedures, heat transfer correlations, diffusion coefficients in liquid gallium/indium solution, melting and boiling points, thermal conductivity, heat capacity, and electrical resistivity

**B76-10191**

**CHEMILUMINESCENT PREDICTION OF SERVICE LIFE**

J A Hassell (Battelle Mem Inst.), G D Mendenhall (Battelle Mem Inst.), and R A Nathan (Battelle Mem Inst.)

Aug 1976 See also NASA-CR-147463 (N76-18276)

**MSC-16010**

Vol 1, No 2, p 199

Technique can be used to predict polymer degradation under actual expected-use conditions, without imposing artificial conditions. Smooth or linear correlations are obtained between chemiluminescence and physical properties of purified polymer gums

**B76-10192**

**THERMOLUMINESCENCE FOR FORENSIC ANALYSIS**

D D Lawson

Aug 1976 See also B76-10193

**NPO-11607**

Vol 1, No 2, p 200

Apparatus is used to determine commonality of origin of physical evidence

**B76-10193**

**LOW-TEMPERATURE THERMOLUMINESCENCE**

D D Lawson and J D Ingham

Aug 1976 See also B76-10192

**NPO-11935**

Vol 1, No 2, p 202

Technique for determining commonality of origin of materials is applicable to materials which are not solids at room temperature and heat-sensitive materials. Contamination of sample is avoided by using sealed sample cup. Technique is useful for determining origins of oil pollutants and has potential in mapping of lakes and/or oceans

**B76-10194**

**SOLVENTLESS INTUMESCENT COATINGS**

S Schwartz (Hughes Aircraft Co.)

Aug 1976 See also NASA-CR-137706 (N75-28228)

**ARC-10996**

Vol 1, No 2, p 203

Composition, requiring no hydrocarbon solvent, can be applied in smooth layers and molded or pressed into variety of shapes

**B76-10195**

**THERMAL/ACOUSTICAL INSULATION FOAM**

R Y Lin (Carborundum Co.) and E A Struzik (Carborundum Co.)

Aug 1976 See also NASA-CR-141498 (N75-15803)

**MSC-14796**

Vol 1, No 2, p 204

Lightweight low-density substance can be used as fire resistant insulation in aircraft. Material density can be controlled over range from 0.6-1.2 pounds per cubic foot and has good thermal and acoustic properties

**B76-10196**

**COATING FOR SOLAR PANELS**

R W Gumbs (R Gumbs Assoc.)

Aug 1976

**M-FS-23420**

Vol 1, No 2, p 205

Inexpensive composition with high energy-absorptivity and low emissivity requires no primers for adhesion to aluminum,

copper, and stainless steel and uses commercially available materials

#### B76-10197

##### IMPROVED INSULATION MATERIAL

Innovator not given (Beech Aircraft Corp) Aug 1976

MSC-14642

Vol 1, No 2, p 205

Multilayer material consisting of embossed, silver-coated Mylar, Nylon net, and silk net is useful for thermal-protection systems and cryogenic containers. Embossing serves two purposes: helps separate radiation barriers and controls radiant energy diffusion. Insulation requires no maintenance after installation.

#### B76-10198

##### AUTOMATED SOLVENT CONCENTRATOR

J S Griffith and J L Stuart

Aug 1976 See Also B76-10199 B76-10200

NPO-13068

Vol 1, No 2, p 206

Designed for automated drug identification system (AUDRI) device increases concentration by 100. Sample is first filtered removing particulate contaminants and reducing water content of sample. Sample is extracted from filtered residue by specific solvent. Concentrator provides input material to analysis subsystem.

#### B76-10199

##### PRECOLUMN FOR EXTRACT CONCENTRATION

V J Jahnsen and W G Bloom

Aug 1976 See also B76-10198, B76-10200

NPO-13083

Vol 1, No 2, p 207

AUDRI requires test sample separation into organic compound families for subsequent insertion into several parallel chromatographs. Sample is first extracted by selective organic solvents. Solvent is then removed from extract to increase extract-to-solvent ratio increasing system sensitivity. Backflushing of precolumn serves as cleanser.

#### B76-10200

##### FRACTION-STORAGE UNIT FOR DRUG-IDENTIFICATION SYSTEM

C F Campen and J L Stuart

Aug 1976 See also B76-10198 B76-10199

NPO-13111

Vol 1, No 2, p 208

Device, connecting outputs of all gas chromatographs to single, relatively inexpensive IR spectrometer reduces costs of system. Storage unit provides buffer storage of samples until infrared spectrometer is ready to accept them. Storage unit can be used to separate overlapping peaks.

#### B76-10201

##### ABRASION-RESISTANT COATINGS FOR PLASTIC SURFACES

T J Wydeven and J R Hollahan (Tegal Corp)

Aug 1976 See also B73-10507

ARC-10915

Vol 1, No 2, p 210

Optically clear composition of organosilicon compounds insulates plastic surfaces and protects them from abrasion. Plasma polymerization process produces superior uniformity and clarity than previous coating techniques.

#### B76-10202

##### GROWING CRYSTALS FROM EUTECTIC MELTS

B N Bhat (Nat'l Res Council)

Aug 1976

M-FS-22926

Vol 1, No 2, p 210

Inverted Bridgman Method yields crystals of higher homogeneity and better structure than those grown by ordinary Bridgman method. Process controls thermotransport by holding molten alloy in known temperature for known period of time. Rapid cooling quenches in state of segregation. Method is applicable to other eutectiferous systems where thermotransport is appreciable.

#### B76-10203

##### COMPRESSED AIR CYLINDER PALLET

K G Highley (Rockwell Intern Corp)

Aug 1976

MSC-19217

Vol 1, No 2, p 211

Device simultaneously handles up to twenty standard size, compressed air cylinders with improved safety.

#### B76-10204

##### PYROIONIC INFRARED DETECTOR

A Sher (William and Mary Coll)

Aug 1976

LANGLEY-11921

Vol 1, No 2, p 212

Device functions near room temperature and is not sensitive to vibrations.

#### B76-10205

##### SEPARATION OF WATER FROM AIR SAMPLES

B J Tyson and G C Carle

Aug 1976

ARC-10890

Vol 1, No 2, p 213

Gas chromatograph with sorbitol column, used in a three-part system separates collected water from preconcentrated air samples.

#### B76-10206

##### VAPOR CORROSION INHIBITORS

L A Bielman (Rockwell Intern Corp)

Aug 1976

M-FS-19232

Vol 1, No 2, p 213

Report describes effectiveness and materials compatibility of amine nitrites. Particularly of value to those interested in long-term corrosion protection.

#### B76-10352

##### FRACTION COLLECTOR FOR ELECTROPHORESIS

M Bier (Veterans Admin Hosp, Tucson, Ariz)

Jan 1977

M-FS-23459

Vol 1, No 3, p 379

Rotating-tube electrophoresis apparatus employs rotating jet of eluting buffer to reduce effects of convection during separation. Designed for separation of microorganisms and biological species. System combines gravity/gradient compensating of lumen with buffer flush at fraction outlet to increase separation efficiency.

#### B76-10353

##### MOLECULAR BEAM GENERATOR

R G Richmond, T H Allen (McDonnell-Douglas Corp), R M F Linford (McDonnell-Douglas Corp), and J E Wittman (McDonnell-Douglas Corp)

Jan 1977 See also NASA-CR-144376 (N75-29135)

MSC-14996

Vol 1, No 3, p 380

Vacuum deposition generator has nozzle and aperture designed especially for beams of heavy organic molecules. Deposition rates are from 6 to 15 angstroms per minute.

#### B76-10354

##### CATALYTIC OXIDATION OF WASTE MATERIALS

R B Jagow (Lockheed Missiles and Space Co)

Jan 1977

MSC-14831

Vol 1, No 3, p 381

Aqueous stream of human waste is mixed with soluble ruthenium salts and is introduced into reactor at temperature where ruthenium black catalyst forms on internal surfaces of reactor. This provides catalytically active surface to convert oxidizable wastes into breakdown products such as water and carbon dioxide.

#### B76-10355

##### COMPOSITE LAMINATE WARPAGE

C C Chamis

Jan 1977 See also NASA-TM-X-71619 (N75-11048)

LEWIS-12615

Vol 1, No 3, p 382

Set of simplified equations predicts warpage that often occurs upon removal from fabrication mold. Equations predict corner deflection and are based upon micromechanics and macromechanics of composites, as well as laminate theory. Factors considered

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include ply misorientation fiber migration, and void/volume ratio nonuniformity

### B76-10356

#### DETERMINATION OF TRACE AMOUNTS OF POF3

J N Foster (Rockwell Intern Corp)  
Jan 1977

### LEWIS-10577

Vol 1, No 3, p 383

Approach takes advantage of fact that phosphorous oxyfluoride (POF3) and phosphorous oxychloride (POCl3) both belong to same molecular symmetry group and should have extinction coefficients that are approximately the same Extinction coefficient of reagent-grade POC13 is measured and this coefficient is employed to calculate POF3 concentrations

### B76-10357

#### FLAME-RESISTANT ELASTOMERIC POLYMERS

J T Howarth (Little/Arthur D/, Inc) S G Sheth (Little/Arthur D/, Inc) and K R Sidman (Little/Arthur D/, Inc)  
Jan 1977 See also NASA-CR-144362 (N75-29264)

### MSC-16078

Vol 1, No 3, p 384

Family of polymer formulations, which has limiting oxygen indices from 50 to 100, can be extruded through dies to produce elastic fibers compression molded, dissolved in solvents as required for coatings, and calendered to produce film and embossed sheeting Applications include upholstery, paint products, automobile products, and coated fabrics

### B76-10358

#### ENAMEL FOR HIGH-TEMPERATURE SUPERALLOYS

H Levin (Hughes Aircraft Co) and W E Lent (Hughes Aircraft Co)  
Jan 1977

### M-FS-22804

Vol 1, No 3, p 385

Desired optical and high temperature enamel properties are obtained with glasses prepared from the system  $\text{Li}_2\text{O}-\text{ZrO}_2-n\text{SiO}_2$  Molar compositions range from  $n=4$  to  $n=13$ , to which are added minor amounts in varying combinations of alumina, alkali fluorides boric oxide, alkali oxides, and alkaline earth oxides

### B76-10359

#### SECOND-GENERATION PMR POLYIMIDES

T T Serafini, R D Vannucci and W B Alston (USAAMRDL)  
Jan 1977 See also NASA TM-X-67803 (N71-23367), NASA-TM-X-71616 (N74-34960) NASA-TM-X-71816 (N76-11289), NASA-TM-X-71894 (N76-21337), NASA-TN-D-6877 (N72-29598)

### LEWIS-12738

Vol 1, No 3, p 386

Continuing research has resulted in development of polyimides with improved thermo-oxidative stability at 589 K Polyimides are based on dimethyl ester of 4,4'-(hexafluoro-isopropylidene)-bis(phthalic acid) (HFDE) and p-phenylenediamine (PPDA) and NE

### B76-10360

#### PURITY TEST FOR COPPER-PLATING SOLUTIONS

F B Mansfeld (Rockwell Intern Corp)  
Jan 1977

### M-FS-19298

Vol 1, No 3, p 387

Electrode configuration can be used to measure extent of impurities in acid-copper plating solution It can be inserted into any plating tank and will show whether bath is clean or contaminated, within fifteen minutes

### B76-10361

#### EXPERIMENTAL DATA FOR NEW FIRE-RETARDANT MATERIALS

D E Supkis  
Jan 1977 See also NASA-TM-X-58165 (N76-13040)

### MSC-16022

Vol 1, No 3, p 388

Report contains evaluations of flammability and physical properties of twenty-four upholstery and furnishing materials, such as those used in commercial aircraft Data presented include degradation upon heating, limited oxygen indices, smoke generation, flammability afterglow, and char length

### B76-10514

#### EXTRACTING LIGNINS FROM MILL WASTES

M F Humphrey  
Mar 1977

### NPO-13847

Vol 1, No 4, p 571

Addition of quaternary ammonium compound and activated charcoal to pulp and mill wastes precipitates lignins in sludge mixture Methanol dissolves lignins for separation from resulting slurry Mineral acid reprecipitates lignins in filtered solution Quaternary ammonium compound, activated charcoal as well as water may be recovered and recycled from this process

### B76-10515

#### EXTRACTION OF UREA AND AMMONIUM ION

R T Anselmi (Martin Marietta Corp) R R Husted (Martin Marietta Corp), and J R Schulz (Martin Marietta Corp)  
Mar 1977 See also NASA-CR-137596 (N75-13537)

### ARC-11064

Vol 1, No 4, p 572

Water purification system keeps urea and ammonium ion concentration below toxic limits in recirculated water of closed loop aquatic habitat Urea is first converted to ammonium ions and carbon dioxide by enzymatic action Ammonium ions are removed by ion exchange Bioburden is controlled by filtration through 0.45 micron millipore filters

### B76-10516

#### LESS-COSTLY ACTIVATED CARBON FOR SEWAGE TREATMENT

J D Ingham, J J Kalvinskis, and W A Mueller  
Mar 1977

### NPO-13877

Vol 1, No 4, p 573

Lignite-aided sewage treatment is based on absorption of dissolved pollutants by activated carbon Settling sludge is removed and dried into cakes that are pyrolyzed with lignites to yield activated carbon Lignite is less expensive than activated carbon previously used to supplement pyrolysis yield

### B76-10517

#### SURFACTANT-ASSISTED COAL LIQUEFACTION

G C Hsu  
Mar 1977

### NPO-13904

Vol 1, No 4, p 574

Improved process of coal liquefaction utilizing nonaqueous surfactant has increased oil yield from 50 to about 80% Asphaltene molecule formation of colloid particles is prevented by surfactant Separated molecules present more surface area for hydrogenation reaction Lower requirements for temperature pressure and hydrogen lead to reduction in capital and operation costs

### B76-10518

#### MEMBRANE HAS HIGH UREA-REJECTION PROPERTIES

C C Johnson and T J Wydeven  
Mar 1977

### ARC-10980

Vol 1, No 4, p 575

Membranes are synthesized from ethylene and nitrogen in RF plasma at low power, gas-flow rates, and pressure Ethylene and nitrogen are used because flow rate and partial pressure of each gas can be independently controlled to produce optimum conditions for synthesizing membrane Membrane is particularly useful in recycling and purifying water

### B76-10519

#### CATALYSTS FOR LOW-ENERGY ALDEHYDE PROCESSES

A Gupta, A Rembaum, C Frazier (Caltech), and H B Gray (Caltech)  
Mar 1977

### NPO-13827

Vol 1, No 4, p 576

Photochemical reaction of dicobalt octacarbonyl with polymeric support systems results in formation of polymer bonded metal catalyst Catalyst is used in hydroformylation (addition of carbon dioxide and hydrogen) of olefins to yield aldehydes

### B76-10520

#### DETERMINING EUTECTIC COMPOSITION IN METAL ALLOYS

R L Ashbrook and Y G Kim (Intern Nickel Co)

Mar 1977 See also NASA-TM-X-71765 (N75-29243)

**LEWIS-12633** Vol 1, No 4, p 577

Tube crucible and furnace are used to separate eutectic mixture from trial-melt ingot. As ingot is slowly heated to melting point, initial surface melting will be eutectic mixture. Molten metal is collected at bottom of crucible, where it is solidified.

**B76-10521**

**DETERMINING TOTAL CARBON IN HYDRAZINE**

E E Davis (Bendix Corp)

Mar 1977

**KSC-11022** Vol 1, No 4, p 578

Procedure incorporates modified pyrolysis train. Samples are vaporized before entering furnace to be pyrolyzed at 850 C + or - 25 C. Direct collection of pyrolyzed gas reduces loss of carbon dioxide. Infrared spectroscopy can be used to analyze samples for carbon dioxide content.

**B76-10522**

**NEW DIAMINE HARDENERS FOR EPOXIES**

V L Bell and T L StClair

Mar 1977 See also NASA-CR-145022 (N76-28424)

**LANGLEY-11823** Vol 1, No 4, p 579

Stronger amine-cured polyepoxides can be obtained by using those diaminobenzophenones and diaminodiphenylmethanes that have amine groups located at ortho or meta positions to carbonyl or methylene groups joining two benzene rings.

**B76-10523**

**ELECTROLYTE CELLS MEASURE OXYGEN FUGACITIES**

R J Williams and O Mullins (Lockheed Electronics Co)

Mar 1977 See also NASA-TM-X-58167 (N76-18246)

**MSC-16089** Vol 1, No 4, p 580

System that uses calcia-stabilized zirconia-ceramic electrolyte in oxygen concentration cell can directly measure oxygen fugacity in vertical-quench furnace, redox-control system. System can independently vary temperature and oxygen fugacity during experiments and can record these parameters as function of time.

**B76-10524**

**NUCLEATION OF ELECTRONIC-CRYSTAL REGIONS**

E C Henry (GE), B A Noval (GE), and D R Ulrich (GE)

Mar 1977

**M-F S-23409** Vol 1, No 4, p 581

Technique of improved ceramic-oxide crystal growth utilizes high viscosity solutions (glass or fused solvent). Compositions are selected on basis of technical importance, gravity sensitive properties, and apparent compatibility. Seeded fused-solvent technique uses bismuth germanate, lithium niobate or lead germanate.

**B76-10525**

**VISCOELASTIC FOAM CUSHION**

C C Kubokawa and C Yost (Dyn Systems Inc)

Mar 1977 See also B72-10692 B73-10495

**ARC-11089** Vol 1, No 4, p 582

Foam is viscous and elastic with unusual and useful temperature, humidity, and compression responses. Applied weight and pressure distributed equally along entire interface with foam eliminates any pressure points. Flexible urethane foam is ideal for orthopedic and prosthetic devices, sports equipment, furniture, and crash protection.

**B76-10526**

**STRESS-CORROSION CRACKING DUE TO HYDRAZINE**

M J Adamson and W P Gilbreath

Mar 1977

**ARC-11093** Vol 1, No 4, p 583

Stress corrosion cracking susceptibility in presence of hydrazine is examined for 6061-T6, Ti-6Al-4V(STA), Inconel 718, 410 stainless steel and 4130 steel alloys.

**B76-10527**

**MULTISPECIES TRANSIENT SIMULATOR**

A L Lee (Lockheed Missiles and Space Co)

Mar 1977

**MSC-14862**

Vol 1, No 4, p 583

Computer program predicts transient pressure variation of multispecies gases in large vacuum systems composed of interconnecting compartments.

**B76-10528**

**MULTILAYER INSULATIVE SYSTEMS**

K L Brinkley and C M Pittman

Mar 1977

**LANGLEY-12057**

Vol 1, No 4, p 583

One dimensional numerical analysis of transient thermal response multilayer insulative system determines temperature distribution through system consisting of one to four layers. Program based on this analysis will determine thickness of specified layer that will satisfy specified temperature-limit criterion at any point in insulative system.

**B76-10529**

**RAPID KINETICS**

A G McLain and C S R Rao (Old Dominion Univ)

Mar 1977

**LANGLEY-12140**

Vol 1, No 4, p 584

Hybrid program for chemical kinetics provides rapid solution to problems involving flowing or static, chemically reacting, gas mixtures.

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**B76-10073**

**QUANTITATIVE BIOLUMINESCENT DETECTION OF BACTERIA**

E W Chappelle and G L Picciolo

Mar 1976

**GSFC-12003**

Vol 1, No 1, p 81

Phosphoflavins in sample are measured using photobacterial luciferase assay technique for flavin mononucleotide (FMN). Boiling perchloric acid is used to rupture cells to free bound flavin and to hydrolyze flavin adenine dinucleotide to FMN. Base-stabilized water solution of sodium borohydride is used as reactant.

**B76-10074**

**EXERCISE SUPPORT FOR THERAPY**

M J Long and S C Inck

Mar 1976

**LANGLEY-11975**

Vol 1, No 1, p 82

Constant-value weight-relieving apparatus, which moves on rollers on overhead track, supports weight of walking, stooping, squatting, or standing patient with combination of multiple pulleys and spring clusters. Individually preselected support force is constant for all movements.

**B76-10075**

**MYOCARDIAL WALL-THICKNESS TRANSDUCER**

C Feldstein, G W Lewis, R H Silver and V H Culler

Mar 1976

**NPO-13644**

Vol 1, No 1, p 83

Device consists of highly compliant circular beam attached to piezoresistive strain gage and barbed needle. Radial deflection of myocardium is measured with minimal disturbance of normal heart functions.

**B76-10076**

**LIGHTWEIGHT ORTHOTIC APPLIANCES**

R M Baucom and T L St Clair

Feb 1976

**LANGLEY-11918**

Vol 1, No 1, p 84

Graphite-filament reinforced polymer materials are used in applications requiring high tensile strength and modulus. Superior properties of graphite composite materials permit fabrication of

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supports that are considerably lighter, thinner, and stiffer than conventional components

### B76-10077

#### REMOTE, UNATTENDED, FOREST FIRE DETECTOR

D J Winslow

Mar 1976

M-FS-21221

Vol 1, No 1, p 85

Instruments for land tract scanning and fire detection include temperature sensor capable of detecting distant match flame, elevated television camera with automatic controls for light balance position, filter, and focus and scanner equipped with photocell to sense intensity of flying spot brought to it by sweep-and-scan mechanism

### B76-10078

#### PROTON TISSUE DOSE

J W Wilson and G S Khandelwal (Old Dominion Univ)

Mar 1976

LANGLEY-11802

Vol 1, No 1, p 85

Program calculates dosage averaged over five major segments of blood-forming organ treating human body geometry in detail but assuming isotropicity of incident primary particles. Approximate form of transport theory is used incorporating nuclear star effects. Two numerical integrations are used to evaluate intermediate equation and then dosage equation

### B76-10207

#### OCCLUSIVE-CUFF CONTROLLER

J T Baker (Technol Inc), G W Hoffer (Technol Inc), and W Hursta

Aug 1976

MSC-14836

Vol 1, No 2, p 217

Device can be automatically set to supply desired amount of pressure for given time and may be triggered manually or from patient's electrocardiograph

### B76-10208

#### FIREFLIGHTER'S BREATHING SYSTEM

P B McLaughlin, E A Gorgini (Scott Aviation), J L Sullivan (Scott Aviation), M R Simmonds (Scott Aviation), and E J Beck (Martin Marietta Corp)

Aug 1976

MSC-14733

Vol 1, No 2, p 218

System, based on open-loop demand-type compressed air concept, is lighter and less bulky than former systems, yet still provides thirty minutes of air supply. Comfort, visibility, donning time, and breathing resistance have been improved. Apparatus is simple to recharge and maintain and is comparable in cost to previously available systems

### B76-10209

#### MANUAL DEXTERITY EVALUATOR

H P Bergeron, J D Holt, and P A Gainer

Aug 1976

LANGLEY-12022

Vol 1, No 2, p 219

Device incorporates relatively inexpensive, simple hand-controlled tracker that moves over horizontal two-dimensional surface. Device is applicable as a two-dimensional or three-dimensional plotter to perform as X/Y curve plotter, area calculator under a randomly shaded curve, and displacement tracker

### B76-10210

#### ASEPTIC FLUID-TRANSFER SYSTEM

J C Arnett, R M Berkman, and E L Cleland

Aug 1976

NPO-13743

Vol 1, No 2, p 220

Inexpensive storage and transfer system allows blood and other fluids to be added or removed without contamination. Device heat-sterilizes external surfaces of terminals and forms sterile passageway between terminals

### B76-10211

#### GRAPHITE-REINFORCED BONE CEMENT

A C Knoell

Aug 1976

### NPO-13764

Vol 1, No 2, p 221

Chopped graphite fibers added to surgical bone cement form bonding agent with mechanical properties closely matched to those of bone. Curing reaction produces less heat, resulting in reduced traumatization of body tissues. Stiffness is increased without affecting flexural strength

### B76-10212

#### PHYSICIAN'S MODERN 'BLACK BAG'

C K Lapinta, J L Day, A E Schulze (Telecare Inc), and G A Zivley (Telecare, Inc)

Aug 1976

MSC-14936

Vol 1, No 2, p 222

Physician's capabilities for on-site treatment are expanded by lightweight compact medical kit, which contains practically all instrumentation of well-equipped medical office

### B76-10213

#### BIRTH/DEATH PROCESS MODEL

C B Solloway and W Wakeland (Harvey Mudd Coll)

Aug 1976

NPO-13616

Vol 1, No 2, p 224

First-order Markov model developed on digital computer for population with specific characteristics. System is user interactive, self-documenting, and does not require user to have complete understanding of underlying model details. Contains thorough error-checking algorithms on input and default capabilities

### B76-10362

#### MEASURING MANDIBULAR MOTIONS

J Dimeff, S Rositano, and R C Taylor (California Univ)

Jan 1977

ARC-10956

Vol 1, No 3, p 391

Mandibular motion along three axes is measured by three motion transducers on floating yoke that rests against mandible. System includes electronics to provide variety of outputs for data display and processing. Head frame is strapped to test subject's skull to provide fixed point of reference for transducers

### B76-10363

#### DISPOSABLE BIOMEDICAL ELECTRODE

J D Frost Jr (Methodist Hosp, Houston, Tx) and C E Hillman, Jr (Methodist Hosp, Houston, Tx)

Jan 1977. See also B76-10642, B76-10364

MSC-14623

Vol 1, No 3, p 392

Reusable recording cap equipped with compressible snap-on bioelectronic electrodes is worn by patient to allow remote monitoring of electroencephalogram and electro-oculogram waveforms. Electrodes can be attached to inside surface of stretch-textile cap at twelve monitoring positions and at one or two ground positions

### B76-10364

#### AUTOMATED EEG ACQUISITION

J D Frost Jr (Methodist Hosp, Houston, Tx) and C E Hillman, Jr (Methodist Hosp, Houston, Tx)

Jan 1977. See also B76-10363, NASA-CR-147554 (N76-22888)

MSC-16111

Vol 1, No 3, p 393

Automated self-contained portable device can be used by technicians with minimal training. Data acquired from patient at remote site are transmitted to centralized interpretation center using conventional telephone equipment. There, diagnostic information is analyzed, and results are relayed back to remote site

### B76-10365

#### REMOTE WATER-MONITORING SYSTEM

D C Grana and D P Haynes

Jan 1977

LANGLEY-11973

Vol 1, No 3, p 395

General-purpose, water-quality sampling process detects microorganisms and integrates sampling, sample preservation, and sample analysis. System overcomes difficulties in correlation of surface measurements with remote measurements and minimizes human error in handling of samples and instrumentation

**B76-10366****ROCKING-MOTION SENSOR FOR THE BLIND**

A Mandell, J E Morgan (Martin Marietta Corp), and J T Polhemus (Martin Marietta Corp)  
Jan 1977

**MSC-14805**

Vol 1, No 3, p 396

Feedback system notifies wearer when specific types of body motion occur

**B76-10367****ACCELERATOR FOR BIOMEDICAL STUDIES**

G L Shillinger, Jr  
Jan 1977

**ARC-10898**

Vol 1, No 3, p 398

Spring-operated accelerator produces precise and repeatable linear accelerations

**B76-10368****MULTIPOSITION RESCUE LITTER**

R L Robbins (Rockwell Intern Corp)  
Jan 1977

**MSC-16148**

Vol 1, No 3, p 399

Lightweight stretcher has wide range of applicability in emergency situations. Special hinges and supports eliminate need for separate accessory items and save weight and storage space

**B76-10369****SHORT-RANGE BIOTELEMETRY SYSTEM**

R Lorentz (Southwest Res Inst)  
Jan 1977 See also NASA-CR-144640 (N76-14474)

**MSC-16011**

Vol 1, No 3, p 400

Compact VHF transmitter relays EKG, EEG, and EMG data to receiver located over twenty-five feet away. Device can be used to monitor postoperative patients without cumbersome wires

**B76-10370****DAM - DETECTION AND MAPPING**

Innovator not given Jan 1977

**MSC-16096**

Vol 1, No 3, p 401

Integrated set of manual procedures, computer programs, and graphic devices processes multispectral scanner data from orbiting LANDSAT into precisely registered and formatted maps of surface water and other resources at variety of scales, sheet formats, and tick intervals

**B76-10530****MEAL SYSTEM FOR THE ELDERLY**

G R Primeaux, R G Ritz (Martin Marietta Corp), and G A Hruzak (Technol, Inc)  
Mar 1977 See also NASA-CR-144516 (N76-10898)

**MSC-16062**

Vol 1, No 4, p 587

Packaged meals require no refrigeration and are nutritionally balanced. Single-serving portions are delivered in multiunit packs and are conveniently prepared in the home

**B76-10531****CAUTION AND WARNING SYSTEM**

T M McClung (Garrett Corp), J T Parker (Garrett Corp), and P D Peterson (Garrett Corp)  
Mar 1977 See also NASA-CR-144432 (N75-32760)

**MSC-16046**

Vol 1, No 4, p 588

Battery-operated, biomedical-monitoring and display network is used for intensive-care and patient monitoring. Digital, bus-oriented design enhances simplicity, flexibility, and noise immunity advantages. Network is 100 percent reprogrammable. Malfunctions are immediately displayed, accompanied by proper corrective procedures

**B76-10532****INTERLOCKING BUTTERFLY TOURNIQUET**

L J Raggio (Rockwell Intern Corp) and B E Green (Rockwell Intern Corp)  
Mar 1977

**MSC-19382**

Vol 1, No 4, p 589

Adjustable bandage, designed for one-handed application, closes skin lacerations to any desired degree

**B76-10533****LIQUID-COOLED BRA FOR CANCER DETECTION**

B A Williams, W E Elkins (Aerotherm Corp), and E G Tickner (Aerotherm Corp)  
Mar 1977 See also B74-10249

**ARC-11007**

Vol 1, No 4, p 590

Garment cools entire breast area uniformly, improving sensitivity of thermographic techniques. Flow and temperature of coolant are controlled by system which also monitors skin temperature

**B76-10534****INEXPENSIVE PORTABLE DRUG DETECTOR**

J Dimeff, A H Heimbuch, and J A Parker  
Mar 1977

**ARC-10633**

Vol 1, No 4, p 591

Inexpensive, easy-to-use, self-scanning, self-calibrating, portable unit automatically graphs fluorescence spectrum of drug sample. Device also measures rate of movement through chromatographic column for forensic and medical testing

**B76-10535****IN VIVO BONE-STRAIN TELEMETRY**

D R Young, W H Howard, and E Koenigsberg (Koenigsberg Instr Co)  
Mar 1977

**ARC-11074**

Vol 1, No 4, p 592

System permits long-term measurement of strains resulting from applied skeletal loads. Basic scheme utilizes pulse interval modulation

**B76-10536****FAST MEASUREMENT OF BACTERIAL SUSCEPTIBILITY TO ANTIBIOTICS**

E W Chappelle, G L Picciolo, and C G Schrock (New England Med Center)  
Mar 1977 See also B76-10073

**GSFC-10246**

Vol 1, No 4, p 592

Method, based on photoanalysis of adenosine triphosphate using light-emitting reaction with luciferase-luciferin technique, saves time by eliminating isolation period required by conventional methods. Technique is also used to determine presence of infection as well as susceptibilities to several antibiotics

**B76-10537****BIOMEDICAL ULTRASONOSCOPE**

R D Lee  
Mar 1977

**ARC-10994**

Vol 1, No 4, p 593

Portable, battery-powered device permits noninvasive examination of body's interior and is particularly well suited to real-time examination of heart. Instrument is capable of C-mode, A-mode, and M-mode scan display

**B76-10538****AUTOMATIC MULTIPLE APPLICATOR ELECTROPHORESIS**

B W Grunbaum (California Univ, Berkeley)  
Mar 1977

**ARC-10991**

Vol 1, No 4, p 594

Easy-to-use, economical device permits electrophoresis on all known supporting media. System includes automatic multiple-sample applicator, sample holder, and electrophoresis apparatus. System has potential applicability to fields of taxonomy, immunology, and genetics. Apparatus is also used for electrofocusing

**B76-10539****MINIATURE EMERGENCY OXYGEN UNIT**

R S Gubin, H H Franks, R G Baynes (Bendix Corp), and J A Johnson (Bendix Corp)  
Mar 1977

**KSC-11011**

Vol 1, No 4, p 596

Portable compact device includes resuscitation, inhalation, and aspiration modes. Device reduces extra time required to carry larger apparatus



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**B76-10540**  
**MULTISPECTRAL IMAGING FOR MEDICAL DIAGNOSIS**  
 V J Anselmo  
 Mar 1977

**NPO-13922** Vol 1, No 4, p 597  
 Photography technique determines amount of morbidity present in tissue. Imaging apparatus incorporates numerical filtering. Overall system operates in near-real time. Information gained from this system enables physician to understand extent of injury and leads to accelerated treatment.

**B76-10541**  
**AN ARTIFICIAL LEG FOR HIP DISARTICULATION**  
 W C Vallotton  
 Mar 1977

**ARC-10916** Vol 1, No 4, p 598  
 Apparatus uses energy-storage and damping devices to assist wearer in achieving more normal stride and pace.

## 06 MECHANICS

**B76-10079**  
**HYDROSTATIC LIFT-OFF SEAL**  
 P S Buckmann (Aerojet-Gen Corp)  
 Mar 1976

**M-FS-21496** Vol 1, No 1, p 87  
 Interpropellant turbopump oxidizer seal consists of smooth flat surface on back of second-stage oxidizer impeller, floating seal ring, semistatic piston ring secondary seal, and low pressure flexible-bellows static secondary seal. Seal performs static sealing at rest and controlled leakage sealing in operation.

**B76-10080**  
**IMPROVED CRYOGENIC SHAFT SEALS**  
 W A Gillon Jr (Rockwell Intern Corp) and G F Tellier (Rockwell Intern Corp)  
 Mar 1976

**M-FS-19153** Vol 1, No 1, p 88  
 Seals are designed for use with liquid propellant ball valves at temperatures ranging from -400 F to 130 F and 8,000 psig. Seals are capable of sustaining 90 degree rotation, with substantial amount of lateral and axial play caused by large pressure loads and differential thermal contraction.

**B76-10081**  
**COST SAVING SYNERGISTIC SHAFT SEAL**  
 L P Ludwig and T N Strom  
 Mar 1976

**LEWIS-12119** Vol 1, No 1, p 90  
 Segmented carbon rings used to replace elastomeric seal lip, provide resistance to high temperatures generated in lubricating film. Machining and close manufacturing tolerances of conventional segmented seal are avoided by mounting segmented rings in elastomeric flex section.

**B76-10082**  
**PEAK-ACCELERATION LIMITER**  
 R C Woodbury  
 Mar 1976

**NPO-11940** Vol 1, No 1, p 91  
 Statistical limiter, which protects test specimens during random vibration testing, differentiates between peak acceleration levels that are normal components of vibration signal and those that exhibit damaging characteristics. Device aborts test only when statistical properties of vibration signal change significantly or when catastrophic transient occurs.

**B76-10083**  
**VACUUM-JACKETED LINE SPACER**  
 F A Houte (McDonnell-Douglas Corp), H B McKee (McDonnell-

Douglas Corp), and T C Patten (McDonnell-Douglas Corp)  
 Mar 1976

**MSC-14365** Vol 1, No 1, p 92  
 Device has three integral, equally spaced leaf springs. Springs separate outer vacuum jacket from fluid carrying line yet minimize conductive heat leaks and liquid boiloff. One-piece heat spring has sufficient flexibility to accommodate differential thermal expansion of inner and outer line.

**B76-10084**  
**INEXPENSIVE LEAK-DETECTOR ENVELOPE**  
 T F Lyon (GE)  
 Mar 1976

**LEWIS-11305** Vol 1, No 1, p 93  
 Vacuum chamber is used with mass spectrometer to leak-check helical coils of tubing in large systems.

**B76-10085**  
**ZERO-ANGLE HELICAL COIL**  
 J A Troendle (Lockheed Missiles and Space Co)  
 Mar 1976

**GSFC-10969** Vol 1, No 1, p 94  
 Device is constructed of bimetallic stock material formed into segments of small diameters and fastened together by metal strips. Coil is useful in various types of actuators, such as temperature controls.

**B76-10086**  
**REDUCING COLD FLOW IN ELASTOMERIC O-RINGS**  
 R H Henry (Rockwell Intern Corp) and O K Olsen (Rockwell Intern Corp)  
 Mar 1976

**M-FS-24336** Vol 1, No 1, p 94  
 Pretreatment technique accelerates compression set of O-rings. Seal is pressure loaded, seal and pressure mechanisms are heated to 160 F, load is applied to heated seal causing material to flow, parts are cooled to room temperature, and load is removed.

**B76-10087**  
**FAST PRESSURE-SENSOR SYSTEM**  
 C Gross  
 Mar 1976

**LANGLEY-12003** Vol 1, No 1, p 96  
 Miniature silicon-diaphragm sensors and signal multiplexer are mounted to ganged zero-operate-calibrate pressure selector switches. Device allows in-situ calibration, can be computer controlled, and measures at approximately 10,000 readings per second.

**B76-10088**  
**NONCONTAMINATING METHOD FOR VISUALIZING GAS FLOW**  
 F S Stepka, D Pofert, and R J Goldstein (Minnesota Univ)  
 Mar 1976. See also NASA-CR-72991 (N72-14945)

**LEWIS-12076** Vol 1, No 1, p 97  
 Fog, formed from dry ice and water, is used to simulate coolant inside pressure-tight tank. Coolant's interaction with mainstream flow is observed visually and photographed.

**B76-10089**  
**FLUID CLASSIFIER AND DISSEMINATOR**  
 W C Kocmond (Cornell Aeron Lab Inc) and V A Depalma (Cornell Aeron Lab Inc)  
 Mar 1976

**HQN-10748** Vol 1, No 1, p 97  
 Air-jet mill has two modifications, particle channel and large-particle exhaust port.

**B76-10090**  
**SHOCK-TUBE DRIVER**  
 L P Leibowitz  
 Mar 1976

**NPO-13528** Vol 1, No 1, p 98  
 Annular-arc accelerator consists of cold gas driver expansion section, electrode sections, and shock tube section. Triggering improvement provides higher velocities and reduces contamination.

**B76-10091****SELF-CONTAINED CONSTANT-TEMPERATURE HEAT ABSORBER**

R W Lopez, J L Vaniman, and R R Fisher

Mar 1976

**M-FS-22989**

Vol 1, No 1, p 100

System maintains precise thermal control of heat producing component is not affected by changes in external pressure, ambient thermal environment, or gravity, and operates in both static and spinning attitudes. Size of device's spin axis-oriented orifice determines container pressure which establishes boiling temperature of heat absorption medium.

**B76-10092****LIQUID-RETENTION CANOPY**

J H Dawson (Rockwell Intern Corp) and A F Brux (Rockwell Intern Corp)

Mar 1976

**M-FS-24133**

Vol 1, No 1, p 101

Device prevents severe fuel sloshing and bubbling and redirects fluid motion to tank bottom. Cryogenic boiloff wetted wall areas, and pressure collapse are reduced.

**B76-10093****INTRODUCING CONTROLLED MATTER INTO A FLUID SYSTEM**

C E Hoffman (Rockwell Intern Corp)

Mar 1976

**M-FS-24309**

Vol 1, No 1, p 102

Device consisting of capsule holder and glass inner tube has been developed to handle controlled particulate-contamination samples. Premeasured quantity of particles can be injected into closed fluid system without contamination.

**B76-10094****PROPELLANT SIDE FEED**

W J Guman (Fairchild Hiller Corp)

Mar 1976

**LANGLEY-11082**

Vol 1, No 1, p 103

New solid-propellant configurations increase thrust-to-power ratio of pulsed plasma microthruster and provide possibility of varying thrust. Techniques are adaptable to sputter coating of polymeric material or pulsed ablating light sources.

**B76-10095****RESISTANCE HEATING ELEMENTS WITH SPECIFIC HEATING PROFILES**

M H Hirschberg

Mar 1976

**LEWIS-10719**

Vol 1, No 1, p 104

Bundled interrupted resistance heating elements provide specific heating profiles. Design allows for easily tailored lengths and locations of 'hot sections' and larger surface areas for heat radiation.

**B76-10096****ANALYTIC NUMERICAL SOLUTIONS FOR SHOCK WAVES**

R W MacCormack and A J Paullay (Bronx Community Coll/CUNY)

Mar 1976

**ARC-10959**

Vol 1, No 1, p 105

Study of weak solutions of simple wave equation inviscid Burgers equation, and Euler equations has resulted in technique for accurate prediction of shock waves occurring in inviscid supersonic flows.

**B76-10097****MEASUREMENT OF RAPIDLY-CHANGING HEATING RATES**

E W Schwartz (General Dynamics Corp)

Mar 1976

**LANGLEY-11380**

Vol 1, No 1, p 106

Easily-fabricated heating rate sensor accurately measures heating rates that are changing rapidly. Design is based on numerous heat transfer analyses. Calibration is required but no maintenance is needed other than for the thermocouple system.

**B76-10098****JPL SOLAR POWER EXPERIMENTS**

R K Yasui

Mar 1976

**NPO-13461**

Vol 1, No 1, p 107

Report describes evolution of photovoltaic power systems designed and built for terrestrial use. Discussion focuses on technological problems impeding further systems development. Experiments and test data on seven types of solar panels and six material test specimens are described in detail.

**B76-10099****GUST ALLEVIATION FOR STOL AIRCRAFT**

W I Oehman

Mar 1976. See also NASA-TN-D-7202 (N73-20013)

**LANGLEY-11413**

Vol 1, No 1, p 107

Analytical study suggests method of improving flight performance of airplanes having relatively low wind loading and those flying at low altitudes.

**B76-10100****OUTER FLOW AND TURBULENCE IN BOUNDARY LAYERS**

W C Cliff and V A Sandborn

Mar 1976

**M-FS-23286**

Vol 1, No 1, p 108

Results presented in report indicate that perturbations travel through boundary layer and give rise to turbulence production process which occurs near viscous sublayer. Part of turbulence produced near wall in turn, moves outward and eventually produces convoluting outer edge of boundary layer to reproduce and sustain itself.

**B76-10101****PRESSURE TUBE INSTRUMENTATION**

G Foerster, O Mehmed, and R Mueller

Mar 1976

**LEWIS-12539**

Vol 1, No 1, p 108

Set of standards in the form of drawings provides detailed information about materials fastening techniques, surface finishes, critical dimensions, quality control specifications, and installation methods for variety of static and total pressure tube instrumentation.

**B76-10102****JOULE-THOMSON DATA CURVES**

H W Beimgraben (Boeing Co)

Mar 1976

**KSC-10538**

Vol 1, No 1, p 109

Series of graphs shows temperature-pressure relationship for air, nitrogen, helium, oxygen, and hydrogen when flowing across line restriction over wide range of temperatures and pressures. Graphs can be applied as engineering guides for component manufacturers and piping system designers.

**B76-10103****OPTIMAL INSENSITIVE-CONTROLLER SYNTHESIS**

C A Harvey (Honeywell, Inc) and Y S Lee (Honeywell Inc)

Mar 1976

**M-FS-21666**

Vol 1, No 1, p 109

Proof of two theorems is included in report. Local sufficiency condition for existence of insensitive controllers in the case of sufficiently small parameter variations and necessary condition for optimal controller corresponding to point in boundary of domain of admissible parameter variations to be optimal insensitive controller.

**B76-10104****NASTRAN COMPONENT-MODE SYNTHESIS**

R J Guyan (Rockwell Intern Corp)

Mar 1976

**MSC-19632**

Vol 1, No 1, p 110

Procedure for dynamic substructuring analysis technique is generally as follows: calculation of component modes, selection of component normal modes, calculation of component generalized matrices, assembly of system matrices, and computation of normal modes, and retrieval of component response.

## 06 MECHANICS

**B76-10105**

**MINIVER MINIATURE VERSION OF REAL/IDEAL GAS AERO-HEATING AND ABLATION COMPUTER PROGRAM**

D R Hendler (McDonnell-Douglas Corp)

Mar 1976

**M-FS-21951**

**Vol 1, No 1, p 110**

Computer code is used to determine heat transfer multiplication factors, special flow field simulation techniques, different heat transfer methods, different transition criteria, crossflow simulation, and more efficient thin skin thickness optimization procedure

**B76-10106**

**ESOP VERSION IV ENERGY SYSTEMS OPTIMIZATION PROGRAM**

Innovator not given (Lockheed Electronics Co) Mar 1976

**MSC-14854**

**Vol 1, No 1, p 110**

Program has six general analytical components waste disposal heating/cooling loads, energy requirements, power generation, waste water treatment, and conventional utility system

**B76-10107**

**TANGENT-OGIVE NOSE CONES**

L D Wing

Mar 1976

**GSFC-11468**

**Vol 1, No 1, p 111**

Program calculates aerodynamic heating and shear stresses at wall for tangent-ogive noses that are slender enough to maintain an attached nose shock during portion of flight when heat transfer from boundary layer to wall is significant

**B76-10108**

**DYNGEN**

J F Sellers and C J Daniele

Mar 1976

**LEWIS-12506**

**Vol 1, No 1, p 111**

Steady-state and transient performance of turbofan and turbojet engines are analyzed Program uses large time steps, gives analyst freedom in selecting equations needed to describe system, and eliminates discrepancies in answers often generated by transient and steady-state simulations

**B76-10109**

**VENTING FOR CONDENSATION IN GAS LINES**

R A Moses (Rockwell Intern Corp)

Mar 1976

**MSC-19621**

**Vol 1, No 1, p 112**

Computer program provides information on quantity of condensate and effect of line heat transfer and temperature on eliminating or minimizing condensate that might affect gas flow adversely

**B76-10110**

**REJECT**

B H Anderson

Mar 1976

**LEWIS-12375**

**Vol 1, No 1, p 112**

Computer program determines performance and flow field characteristics of supersonic ejector nozzle It includes sonic line effects and interaction analysis for mixing process between primary and secondary flows of nozzle

**B76-10111**

**BUCLAP2**

D W Halstead (Boeing Co) L L Tripp (Boeing Co), M Tamekuni (Boeing Co) L L Baker (Boeing Co) and A V Viswanathan (Boeing Co)

Mar 1976

**LANGLEY-11696**

**Vol 1, No 1, p 112**

Program is used to predict buckling of rectangular flat and curved laminated plates subjected to in-plane normal and shearing loads with each lamina composed of orthotropic material with arbitrary orientation of orthotropic axes

**B76-10112**

**SWEPT-TAPERED-WING AERODYNAMICS**

L E Putnam

Mar 1976

**LANGLEY-11701**

**Vol 1, No 1, p 113**

Computer program calculates effects on lift and drag of blowing two jets over swept tapered wing at low subsonic speeds Algorithm used is based on vortex lattice representation of wing lifting surface on line source-sink distribution to represent effects of exhaust jets

**B76-10113**

**SESO PROGRAM FOR SOLAR-ENERGY HEATING-SYSTEMS ANALYSIS**

Innovator not given (Lockheed Electronics Co) Mar 1976

**MSC-14853**

**Vol 1, No 1, p 113**

Space heating and cooling loads are calculated for each building based on outside environment, desired inside conditions, building construction and geometry, domestic power usage, occupancy rate, and occupant metabolic rate Loads are summed to determine requirements of central and alternative utility systems

**B76-10214**

**CONSTANT-RATE FLUID-DELIVERY SYSTEM**

D S Jacob (Beckman Instr, Inc)

Aug 1976

**MSC-14905**

**Vol 1, No 2, p 227**

Mechanical-feedback regulated modulating valve maintains pressure in bag equal to that within bellows, causing fluid to be expelled at a constant rate Adaptable to systems where bellows are replaced by cylinders bladders, or diaphragms

**B76-10215**

**ROUS SYSTEM**

J S Heyman

Aug 1976

**LANGLEY-12015**

**Vol 1, No 2, p 228**

Ultrasonic generator/monitor, appropriate for lab and field use is used to measure ultrasonic parameters and determine certain physical properties of test region Reflection-oscillator ultrasonic spectrometer is sensitive, inexpensive, has no duty-cycle effects, is simple in construction and use, and for resonance measurements, takes advantage of sensitivity enhancement, and has high frequency stability

**B76-10216**

**ROUS BOLT-TENSIONING MONITOR**

J S Heyman and F D Stone

Aug 1976

**LANGLEY-12016**

**Vol 1, No 2, p 229**

Closed-loop feedback circuit system used to measure bolt tension Advantages are its simplicity, higher accuracy, and potential low cost

**B76-10217**

**COMPUTER-AUTOMATED ULTRASONIC INSPECTION SYSTEM**

D Dunmyer (General Dynamics Corp), A H Gardner (General Dynamics Corp), E E Kerlin (General Dynamics Corp), J S Kunselman (General Dynamics Corp), A R Robinson (General Dynamics Corp), T C Walker (General Dynamics Corp), T G Wells (General Dynamics Corp), and B G W Yee (General Dynamics Corp)

Aug 1976

**M-FS-23338**

**Vol 1, No 2, p 230**

Computer system automatically analyzes and records ultrasonic weld inspection data Unit can be operated in three modes manual, automatic and computer-controlled

**B76-10218**

**FAIL-SAFE HYDRAULIC SHAKER PROTECTION**

R C Woodbury

Aug 1976

**NPO-13726**

**Vol 1, No 2, p 231**

Nine channel system controls acceleration and force on structure undergoing vibration stress testing System has automatic and manually operative abort feature

**B76-10219****PUMP FAILURE MONITOR**

J L Frarey (Shaker Res Corp), D S Wilson (Shaker Res Corp) and R F Burchill (Shaker Res Corp)  
Aug 1976

**M-FS-23366****Vol 1, No 2, p 232**

High-frequency vibration technique predicts failure in pumps

**B76-10220****VAPOR/LIQUID INTERFACE SENSOR**

J E Briegy  
Aug 1976

**MSC-12474****Vol 1, No 2, p 233**

Fluidic circuit senses level of liquid nitrogen in pipe or container by responding to pressure changes

**B76-10221****IMPROVED HIGH-TEMPERATURE HEATER WITH STABILIZED-ZIRCONIA ELEMENTS**

C R Halbach (Advanced Res and Technol) and R J Page (Advanced Res and Technol)  
Aug 1976

**M-FS-23361****Vol 1, No 2, p 234**

Improved conducting-ceramic heating elements extend performance and life expectancy of 2 100 C furnace

**B76-10222****HOT-WIRE PROBE**

V Mikulla  
Aug 1976

**ARC-10900****Vol 1, No 2, p 236**

High-temperature platinum probe measures turbulence and Reynolds shear stresses in high-temperature compressible flows. Probe does not vibrate at high velocities and does not react like strain gage on warmup

**B76-10223****'THERMAL-DIODE' HEAT PIPE**

J P Kirkpatrick, B Swierdling (Grumman Aircraft Corp) and R Kosson (Grumman Aircraft Corp)  
Aug 1976

**ARC-10997****Vol 1, No 2, p 237**

Device transfers heat in one direction and blocks heat transfer in opposite direction

**B76-10224****FATIGUE LIFE OF SPUR AND HELICAL GEAR SETS**

D P Townsend, E V Zaretsky and J J Coy (USAAMRDL)  
Aug 1976 See also NASA-TN-D-8029 (N75-29434), NASA-TN-D-8045 (N75-30564)

**LEWIS-12596****Vol 1, No 2, p 238**

Mathematical model is used to determine surface fatigue life of spur and helical gears. Can also be used to calculate dynamic capacity

**B76-10225****FASTER X-RAY ANALYSIS OF SEMICONDUCTOR WAFERS**

D L Parker (Texas A and M Univ) and W A Porter (Texas A and M Univ)  
Aug 1976

**M-FS-23315****Vol 1, No 2, p 238**

X-ray camera, through use of vacuum chuck significantly reduces cost per topograph by bending semiconductor wafer by at least one order of magnitude

**B76-10226****ATTENUATION OF SOUND IN DUCTS WITH ACOUSTIC TREATMENT**

E J Rice  
Aug 1976 See also NASA-TM-X-71830 (N76-12827)

**LEWIS-12686****Vol 1, No 2, p 239**

Generalized approximate equation for duct-lining sound attenuation can be used for initial acoustic-liner design and analysis

**B76-10227****FROZEN-FLUID LINE REPAIR**

J A Stein (Rockwell Intern Corp)  
Aug 1976

**MSC-19132****Vol 1, No 2, p 240**

Improved line-freezing equipment permits fluid line repairs in previously inaccessible areas

**B76-10228****SIMPLIFIED EXPLOSIVE-WELD EVALUATION**

D M McLarty (Martin Marietta Corp)  
Aug 1976

**MSC-14654****Vol 1, No 2, p 241**

Weld surfaces coated with commercially available molybdenum disulfide, allow visual inspection of significant indications of bond quality. Process reduces number of trial welds making explosive bonding more competitive

**B76-10229****NOMOGRAPH FOR CASTOR-CUSHION DESIGN**

G L Dillard (Rockwell Intern Corp)  
Aug 1976

**MSC-17094****Vol 1, No 2, p 242**

Diagram aids development of castor cushions with individual suspension characteristics

**B76-10230****CABLE-LOAD EQUALIZATION SYSTEM**

R W Benjamin (Rockwell Intern Corp)  
Aug 1976

**MSC-17494****Vol 1, No 2, p 243**

Limited-slip differential, used to drive dual-cable winches synchronizes winding speeds and ensures equal loading of both cables

**B76-10231****ANALYSIS OF BONDED JOINTS**

S R Srinivasa (Argonne Natl Lab)  
Aug 1976 See also NASA-TN-D-7855

**LANGLEY-11871****Vol 1, No 2, p 243**

Report describes analysis of single-lap double-lap and flush joints for peel and shear stresses

**B76-10232****FLUID HANDLING EQUIPMENT**

Innovator not given Aug 1976 See also NASA-SP-5976(03)

**HQN-10890****Vol 1, No 2, p 244**

Report describes twenty-four concepts and methods developed for fluid transport technology

**B76-10233****HEAT PIPE TECHNOLOGY**

Innovator not given (New Mexico Univ) Aug 1976

**HQN-10901****Vol 1, No 2, p 244**

Continuing bibliography with abstracts of technical reports, books, conference papers, foreign reports and translations, patents, and other documents. Author, subject, and patent indexes included

**B76-10234****CRYOGENIC STORAGE TANK THERMAL ANALYSIS**

J P Wright (Rockwell Intern Corp)  
Aug 1976

**MSC-19103****Vol 1, No 2, p 244**

Parametric study discusses relationship between cryogenic boil-off and factors such as tank size, insulation thickness and performance, structural-support heat leaks and use of vapor-cooled shields. Data presented as series of nomographs and curves

**B76-10235****SOLAR HEATING AND COOLING PERFORMANCE**

J W Littles and J C Cody  
Aug 1976

**M-FS-23432****Vol 1, No 2, p 245**

Study describes technique developed for comparison of devices to determine if conventional energy resources may be saved

**B76-10236****THERMAL NETWORK MODELING HANDBOOK**

Innovator not given (TRW Systems Group) Aug 1976 See also NASA-CR-144418 (N75-30483)

**MSC-14964**

Vol 1, No 2, p 245

Reference describes standard formulas, techniques, and terminology used in constructing mathematical models

**B76-10237****IMPEDANCE OF CURVED DUCTS**

W A Rostafinski

Aug 1976 See also NASA-TM-X-2698 (N73-15705) NASA-TM-X-71827 (N76-13881)

**LEWIS-12636**

Vol 1, No 2, p 245

Mathematical solution permits showing that, for circular bends in hardwalled ducts of rectangular cross sections, specific acoustic impedance depends on both frequency and geometry of bend

**B76-10238****REMOTE SENSING OF NATURAL RESOURCES**

Innovator not given (New Mexico Univ) Aug 1976

**HQN-10899**

Vol 1, No 2, p 246

Quarterly literature review compiles citations and abstracts from eight major abstracting and indexing services Each issue contains author/keyword index Includes data obtained or techniques used from space, aircraft or ground-based stations

**B76-10239****NECAP NASA ENERGY-COST ANALYSIS PROGRAM**

Innovator not given (GATX Inc) Aug 1976

**LANGLEY-11888**

Vol 1, No 2, p 247

Computer program evaluates design and operation of facilities in regard to building energy consumption

**B76-10240****SHOCK INTERFERENCE PATTERNS AND HEATING**

D J Morris and J W Keyes

Aug 1976

**LANGLEY-11497**

Computer programs calculate two-dimensional patterns for six types of supersonic and hypersonic interference flow fields and surface heating

**B76-10241**

Vol 1, No 2, p 248

**COMOC A FINITE-ELEMENT ALGORITHM FOR THE NAVIER-STOKES EQUATIONS**

A J Baker (Bell Aerospace Corp), A M Bauer (Bell Aerospace Corp), P D Manhardt (Bell Aerospace Corp), and J A Orzechowski (Bell Aerospace Corp)

Aug 1976

**LANGLEY-11480**

Vol 1, No 2, p 247

Finite-element algorithm devised to facilitate solution of two-dimensional Navier-Stokes equations governing kinematics and thermodynamics of variable-viscosity, compressible, multiple-species fluid Algorithm has been implemented into existing computer program system

**B76-10242****PREDICTING OFF-DESIGN PERFORMANCE OF RADIAL-INFLOW TURBINES**

C A Wasserbauer and A J Glassman

Aug 1976 See also B69-10267

**LEWIS-12500**

Vol 1, No 2, p 249

Computer program is useful where performance at design operating point is known and as design guide

**B76-10243****CRACK-GROWTH ANALYSIS**

C Bianca and M Creager (Dell West Assoc)

Aug 1976

**M-FS-23320**

Vol 1, No 2, p 249

Flexible adaptable integrative routine computer program incorporates Collipriest-Ehret and Paris-Forman equations It calculates growth from initial defect size and terminates calculation when crack is sufficiently large for critical condition Wheeler, Willenborg and Grumman Closure models are available

**B76-10371****FLEXIBLE-PILE THERMAL SEALANT**

G E Anderson (Rockwell Intern Corp), D M Fell (Rockwell Intern Corp) and J S Tesinsky (Rockwell Intern Corp)

Jan 1977

**MSC-19568**

Vol 1, No 3, p 405

Brushlike material insulates variable-width gaps where severe thermal stress is present Weave-and-tuft strip has low thermal conductivity working temperature range from -454 to 2,000 F, low load compressibility, and good inhibition of plasma flow

**B76-10372****ULTRASONIC MEASUREMENT OF FRACTURE TOUGHNESS**

A Vary

Jan 1977 See also NASA-TM-X-71769 (N75-29241), NASA-TM-X-71889 (N76-21319)

**LEWIS-12642**

Vol 1, No 3, p 406

Inexpensive nondestructive method ranks materials by crack toughness Method can reduce expenses involved in conventional mechanical destructive testing and can be inspection tool in determining local variations of materials in fracture-prone components

**B76-10373****WINGTIP SMOKE GENERATOR**

J R Rogers

Jan 1977

**ARC-10905**

Vol 1, No 3, p 407

Device produces nontoxic smoke of low particle density assisting in investigation and study of aircraft wingtip vortexes in flight It can be dimensioned according to available current and oil capacity

**B76-10374****MEASURING TRACE DISPERSANTS IN GAS STREAMS**

O L Updike (Virginia Univ)

Jan 1977

**ARC-10896**

Vol 1, No 3, p 408

Detection system uses phase shift of acoustic waves to measure amount of gaseous substances on sorption sensor Three-part device optimizes stability and assists in achieving low-phase-noise levels

**B76-10375****NOISE SUPPRESSOR FOR TURBOFAN-JET ENGINES**

D Y Cheng (Santa Clara Univ)

Jan 1977

**ARC-10812**

Vol 1, No 3, p 409

Exhaust nozzle equipped with bypass separators is basis of lightweight device Innovation does not reduce thrust unduly and has no moving parts

**B76-10376****AIR-SUSPENDED DYNAMOMETER TABLE**

T A Casad

Jan 1977

**NPO-13794**

Vol 1, No 3, p 410

Device improves accuracy of fractional-horsepower testing

**B76-10377****TIME-DOMAIN REFLECTOMETRY FOR CABLE-FAULT ISOLATION**

K D Wood (IBM)

Jan 1977

**KSC-10741**

Vol 1, No 3, p 411

Instrument can be used to isolate fault at specific multiple-cable splice location

**B76-10378****FLUID-FILM BEARING DAMPER**

R E Cunningham

Jan 1977 See also NASA-TN-D-7987 (N75-25192)

**LEWIS-11158**

Vol 1, No 3, p 412

Device for rotating machinery has noncircular support that allows changes in dynamic properties Device can be controlled

for either manually or automatically altering its stiffness and damping properties without interruption of operation

#### **B76-10379**

##### **ALL-NICKEL HOT-WIRE PROBE**

F R Lemos

Jan 1977

**ARC-10911**

**Vol 1, No 3, p 413**

Device operates in supersonic and hypersonic wind tunnels at temperatures of 700 to 760 C

#### **B76-10380**

##### **VELOCITY SENSOR FOR SLOW FLOWS**

W E Simon (Martin Marietta Corp)

Jan 1977

**LANGLEY-11785**

**Vol 1, No 3, p 414**

Inexpensive, easily-constructed device measures flows from 0.2 to 20 feet per second. Instrument is capable of measuring flow velocity and direction in cases where either velocity or density is so low that dynamic pressure is below measurable range. It can be made into hand held instrument for measuring ventilation and air conditioning flow.

#### **B76-10381**

##### **IMPROVED GAS-PRESSURE TRANSDUCER**

J Dimeff

Jan 1977 See also B72-10198 B74-10243 B75-10082

**ARC-10639**

**Vol 1, No 3, p 415**

Optically-selective acoustically-resonant, gas-detecting device is used to measure intensity of radiation-induced pressure variations. Use of diaphragm improves sensitivity and immunity to background noise.

#### **B76-10382**

##### **CONTAMINATION MONITORING OF FLUIDS**

R D Bonnell (South Carolina Univ), R O Pettus (South Carolina Univ), C A Rhodes (South Carolina Univ) and I F Stowers (South Carolina Univ)

Jan 1977

**KSC-11037**

**Vol 1, No 3, p 416**

Electro-optical device, consisting of laser and photodiodes is adaptable to processing industries, pollution control, medical technology and food technology.

#### **B76-10383**

##### **DESIGN OF REDUNDANT SYSTEMS**

L F Doty (Honeywell, Inc)

Jan 1977

**MSC-16026**

**Vol 1, No 3, p 417**

Algorithmic approach is useful for analysis of systems with noisy inputs and when outputs are required in terms of statistical quantities and probabilities of signal excursions beyond desired levels. Procedure can be used with circuits, chemical processes, material design and other systems with known transfer functions and parameter tolerances.

#### **B76-10384**

##### **SUBLIMATOR/EVAPORATOR HEAT SINK**

B W Webbon

Jan 1977

**ARC-10912**

**Vol 1, No 3, p 418**

Economical self-regulating device cools liquids by evaporating portion of liquid through porous tubes. Technique is characterized by high heat transfer rate and structural simplicity.

#### **B76-10385**

##### **LOW-ONSET-RATE ENERGY ABSORBER**

W H Keathley and C J Wesselski

Jan 1977 See also NASA-TM-X-64444 (N70-35706)

**MSC-12279**

**Vol 1, No 3, p 419**

Device controls deceleration rates without amplifying system loads. It dissipates energy of motion through friction heat and is 22 times more efficient than automobile brakes.

#### **B76-10386**

##### **CAPACITIVE SHAFT-ANGLE ENCODER**

R J Hruby and R L Wilson

Jan 1977

**ARC-10897**

**Vol 1, No 3, p 420**

Economical device is less subject to wear than conventional resistive-potentiometer devices.

#### **B76-10387**

##### **AC ADAPTER FOR FUEL-FLOW SENSOR**

L L Millman

Jan 1977

**GSFC-12037**

**Vol 1, No 3, p 422**

Readily-available fuel meters can be used to aid in fuel oil conservation in homes and commercial buildings. Device also includes failure monitor that activates warning light and horn if meter fails.

#### **B76-10388**

##### **PADDLE-PIN ALINEMENT TEST**

D M Gilliam and J A Foster

Jan 1977

**KSC-10740**

**Vol 1, No 3, p 423**

Segmented insulated test bar speeds up patch distributor paddle-pin test. Device eliminates need to disconnect cables or remove distributor. Printed circuit cable and connector reduces weight on bar, adding to tester portability.

#### **B76-10389**

##### **ATMOSPHERE-GENERATING SYSTEM**

R E Mahan (Lockheed Missiles and Space Co), P A Wagner (Lockheed Missiles and Space Co), and W J Conner (Fluid Dyn Corp)

Jan 1977 See also NASA-CR-134390 (N74-31581)

**MSC-14713**

**Vol 1, No 3, p 424**

Electrolytic conversion of hydrazine and water in low-pressure tanks to life-support atmosphere requires lighter weight equipment than high-pressure or cryogenic storage techniques.

#### **B76-10390**

##### **MANUAL TRASH COMPACTOR**

G E Stevenson (Nelson and Johnson Eng., Inc)

Jan 1977

**MSC-16039**

**Vol 1, No 3, p 426**

Device eliminates need for individual refuse bags and disposal containers and may prove less expensive to manufacture and use than powered compactors. Instrument has compressive force of 2 000 pounds.

#### **B76-10391**

##### **TIME-DOMAIN AIRCRAFT MODEL**

D K Scharmack (Honeywell, Inc)

Jan 1977

**MSC-16018**

**Vol 1, No 3, p 427**

Fourier transformation improves aerodynamic coefficients.

#### **B76-10392**

##### **FUNDAMENTALS OF FLUID SEALING**

J Zuk

Jan 1977 See also NASA-TM-X-71851 (N76-17399)

NASA-TN-D-8151 (N76-19462)

**LEWIS-12683**

**Vol 1, No 3, p 427**

Textbook covers fundamentals of fluid sealing. Included are seal performance parameters and seal operating regimes.

#### **B76-10393**

##### **ASTRONAUTIC STRUCTURES MANUAL**

Innovator not given Jan 1977

**M-FS-23547**

**Vol 1, No 3, p 427**

Three-volume reference work serves as catalog of analysis techniques for elastic and inelastic stress ranges and as source on background and development of methods. Information is condensation of published journal articles, industry and university publications, textbooks and government documents.

#### **B76-10394**

##### **CAVITATING PERFORMANCE OF PUMPING MACHINERY**

J Hord (NBS), L M Anderson (NBS) and W J Hall (NBS)

## 06 MECHANICS

Jan 1977 See also NASA-CR-2054 (N72-24363), NASA-CR-2156 (N73-16255) NASA-CR-2242 (N73-28153), NASA-CR-2448 (N74-34704)

**LEWIS-12423** Vol 1, No 3, p 428

Four-volume publication contains extensive cavitation data and simplified technique for predicting cavitation performance of pumps

**B76-10395**

**SOLAR HEATED AND COOLED OFFICE BUILDING**

W L Maag

Jan 1977 See also NASA-TM-X-71615 (N74-34541)

**LEWIS-12512** Vol 1, No 3, p 429

Installation at NASA Langley Research Center Hampton, Virginia, serves as full-scale working test-bed facility to test flat-plate solar-energy collector systems

**B76-10396**

**GEODYN ORBITAL AND GEODETIC PARAMETER ESTIMATION**

B Putney

Jan 1977

**GSFC-12014** Vol 1, No 3, p 429

Computer program is capable of calculating orbit and geodetic parameter estimates Program can also be used for translunar and interplanetary trajectories

**B76-10397**

**AIR-CUSHION LANDING SYSTEMS**

K M Captain (Foster-Miller Associates Inc) A Boghani (Foster-Miller Associates, Inc) and D N Wormley (Foster-Miller Associates, Inc)

Jan 1977

**LANGLEY-11783** Vol 1, No 3, p 430

Computer program based on heave/pitch analysis simulates dynamic behavior during landing impact and taxi over irregular runway Program can be adapted to run on any computer with FORTRAN compiler

**B76-10398**

**ANALYSIS OF AXISYMMETRIC SHELL STRUCTURE**

W B Stephens, G A Cohen (Structures Res Associates), and R T Haftak (Structures Res Associates)

Jan 1977

**LANGLEY-12059** Vol 1, No 3, p 430

Six compatible computer programs analyze stress vibration and buckling characteristics of general shells of revolution

**B76-10399**

**SPAR STRUCTURAL-PERFORMANCE ANALYSIS AND REDESIGN**

W D Whetstone (Lockheed Missiles and Space Co) and L Krefling

Jan 1977

**LANGLEY-12062, M-FS-23182** Vol 1, No 3, p 431

System of processor programs performs stress buckling, and vibrational analysis of large linear finite element systems in excess of 50 000 degrees of freedom, while minimizing processing cost execution time, central memory storage, and secondary data storage requirements Programs use sparse matrix solution techniques and other computational and data management procedures

**B76-10400**

**MATH MODEL OF 3-D AIRCRAFT CONFIGURATION**

C B Craidon

Jan 1977

**LANGLEY-12029** Vol 1, No 3, p 432

Computer program can be used to construct surface equations for aircraft configurations Geometry input section can be replaced to adapt program to any three-dimensional object or objects

**B76-10401**

**TRANSIENT THERMAL ANALYSIS OF FLUID SYSTEMS**

G D Chandler (Rockwell Intern Corp) and R D Trust (Rockwell Intern Corp)

Jan 1977

**MSC-19502**

Vol 1, No 3, p 433

Computer program performs transient thermal analysis of any 2-node to 200-node-thermal network, which transports heat by fluid flow convection Program can be modified to add conduction along tubes and radiation

**B76-10402**

**DETERMINING AIRCRAFT STABILITY AND CONTROL DERIVATIVES**

K W Iliff and R E Maine

Jan 1977

**ARC-10109** Vol 1, No 3, p 433

System of three computer programs determines stability and control derivatives from flight data

**B76-10403**

**SWEPT WING AERODYNAMICS**

F A Dvorak (Flow Res, Inc) and F A Woodward (Flow Res, Inc)

Jan 1977

**ARC-10790** Vol 1, No 3, p 434

Technique analyzes viscosity-dependent aerodynamic characteristics of multielement infinite swept wings in incompressible flow Use of source distributions rather than displacement thickness to represent boundary layer effect on potential flow and of iterative technique for matrix inversion reduces computer time for overall analysis

**B76-10404**

**CONTROL SYSTEM DESIGN**

R C Seidel and B Lehtinen

Jan 1977

**LEWIS-12556** Vol 1, No 3, p 434

Computer program optimizes parameters in feedback controller transfer function

**B76-10542**

**INDICATED MEAN-EFFECTIVE PRESSURE INSTRUMENT**

W J Rice

Mar 1977

**LEWIS-12661** Vol 1, No 4, p 601

Device is capable of measuring and calculating IMEP of internal combustion engines in real time Apparatus is used to provide mass flow measurements in engine cylinder and in measurement of release energy of nonlinear spring

**B76-10543**

**PRECISION MEASUREMENT OF CHANGES IN PHYSICAL DIMENSIONS**

J W Berthold, III (Arizona Univ), S F Jacobs (Arizona Univ), and M Norton (Arizona Univ)

Mar 1977

**M-FS-23527** Vol 1, No 4, p 602

Interferometric method is used to measure small changes in size of optical materials Error introduced with optical phase shifts occurring with time is overcome by using parts of Fabry-Perot resonators with unequal lengths Both stability of optical phase shifts upon reflection from multilayer stacks and dimensional stability of optical contacts is measured

**B76-10544**

**AUTOMATED SECONDARY STANDARD FOR LIQUID FLOWMETERS**

H F Hobart

Mar 1977 See also NASA-TM-X-71876 (N76-18404)

**LEWIS-12695** Vol 1, No 4, p 603

Calibration time is reduced from one hour to fifteen minutes Accuracies of flowmeter calibrations are approximately 99 75 percent, using this standard Standard is also used to test or set flow switches

**B76-10545**

**NONDESTRUCTIVE INTERIOR EXAMINATION OF MOVING PARTS**

F A Baker (Rockwell Intern Corp)

Mar 1977

**M-FS-23378**

Vol 1, No 4, p 604

Microphone and amplified audio system are used in conjunction with X-ray nondestructive testing to detect foreign particles inside moving hardware when particles cannot be located by X-ray alone

**B76-10548****FLANGE WELD PRESSURE TESTING**

C F Holden (Rockwell Intern Corp)

Mar 1977

**M-FS-19292**

Vol 1, No 4, p 605

Device allows localized high-pressure proof test Use of tool eliminates need to block off far end of pipe, only small amount of pressurizing gas is needed only small area needs to be cleared of personnel for proof test

**B76-10547****ULTRASONIC MONITORING OF CRACK EXTENSION**

S J Kliman, D M Fisher, and R J Buzzard

Mar 1977 See also NASA-TM-X-71754 (N75-30606)

**LEWIS-12632**

Vol 1, No 4, p 605

System consisting of commercial ultrasonic flaw detector with transducer clamped to specimen and x-yy' recorder provides permanent record of crack extension, resulting in clear indication of onset of cracking that is relatively insensitive to plastic deformation

**B76-10548****MECHANICAL LOADER FOR TESTING COMPOSITES**

I M Daniel (IIT Res Inst) and T Liber (IIT Res Inst)

Mar 1977 See also NASA-CR-134826 (N75-30264)

**LEWIS-12432**

Vol 1, No 4, p 606

Device applies constant preload to environmentally cycled specimens Loading spring for each specimen has sufficiently large deflection to insure insignificant degree of change in specimen load during thermal cycling

**B76-10549****THERMAL/VACUUM TESTING OF LASER CORNER-CUBE RETROREFLECTORS**

Innovator not given (Bendix Corp) Mar 1977

**M-FS-23565**

Vol 1, No 4, p 608

Test procedure for optimum cube design records beam-return patterns photographically

**B76-10550****ACOUSTIC TESTING OF MATERIALS**

Innovator not given (Bolt, Beranek, and Newman, Inc) Mar 1977

**LANGLEY-11659**

Vol 1, No 4, p 609

Sound-absorption coefficients are measured with or without anechoic chamber

**B76-10551****LEAK TESTING GLASS AMPOULES**

B J Kallman (TRW, Inc)

Mar 1977

**LANGLEY-11988**

Vol 1, No 4, p 610

Test sensitivity is enhanced by using mass spectrometer

**B76-10552****DETECTING CONTAMINATION ON A METAL SURFACE**

J M Harris (Rockwell Intern Corp), H L Marcus (Rockwell Intern Corp) and T Smith (Rockwell Intern Corp)

Mar 1977

**M-FS-19280**

Vol 1, No 4, p 610

Thin layers of contaminant on metal surface are detected by measuring surface-potential difference between reference electrode and surface of interest Procedure does not require mechanical contact with surface under examination

**B76-10553****DETECTION OF SURFACE IMPURITIES ON PROCESSED METALS**

J V Kenkel (Rockwell Intern Corp), F B Mansfield (Rockwell

Intern Corp), H L Marcus (Rockwell Intern Corp), and N E Paton (Rockwell Intern Corp)

Mar 1977

**MSC-19670**

Vol 1, No 4, p 611

Method is based on measurements of electrical conductivity through layer of distilled water that has been deposited on metal surface Conductivity is measured for 15-30 minute period, which is sufficient time to allow surface impurities to dissolve in water

**B76-10554****HEAT-TRANSFER COEFFICIENTS OF PIN-FINNED CYLINDERS**

G J VanFossen, Jr

Mar 1977 See also NASA-TM-X-3173 (N75-14990)

**LEWIS-12557**

Vol 1, No 4, p 612

Pin-finned cylinder can increase heat-transfer rate to more than 4 times that of plain cylinder, depending on pin diameter and spacing Smallest diameter, closest spacing, and largest pin length-to-diameter ratio gives highest average effective heat-transfer coefficients

**B76-10555****MINIATURE-ANGULAR-POSITION TRANSDUCER**

D L Gray and M C Sandford

Mar 1977

**LANGLEY-11999**

Vol 1, No 4, p 613

Simple and inexpensive device using solar cells, measures rapidly-responding active control surfaces of aeroelastically-scaled wind-tunnel models of aircraft Device allows control surfaces to be measured to within 0.10 deg

**B76-10556****ONE-WIRE THERMOCOUPLE**

W D Goodrich and C J Staimach (LTV Aerospace Corp)

Mar 1977 See also B76-10593, NASA-CR-144364 (N75-29356)

**MSC-16220**

Vol 1, No 4, p 614

Nickel alloy/constantan device accurately measures surface temperature at precise locations Device is moderate in cost and simplifies fabrication of highly-instrumented seamless-surface heat-transfer models Device also applies to metal surfaces if constantan wire has insulative coat

**B76-10557****PULSE DETECTOR**

N E Simmons (Rockwell Intern Corp)

Mar 1977

**MSC-16268**

Vol 1, No 4, p 615

Simple device spots opens and shorts during shock and vibration testing Device has excellent temperature stability and consistent timing accuracy Range of detected pulse widths, or time intervals is adjustable

**B76-10558****HYDRODYNAMIC LUBRICATION OF FACE SEALS**

L P Ludwig and G P Allen

Mar 1977 See also NASA-TN-D-8101 (N76-21560), NASA-TN-D-8102 (N76-20484)

**LEWIS-12710**

Vol 1, No 4, p 616

Two companion reports describe possible primary-seal geometries and face-seal angular-misalignment geometry

**B76-10559****IMPACT RESPONSE ANALYSES**

C S Bodley (Martin Marietta Corp), D M Warner (Martin Marietta Corp), and A C Park (Martin Marietta Corp)

Mar 1977

**M-FS-23335**

Vol 1, No 4, p 617

General-purpose computer program establishes dynamic response of two impacting elastic bodies each containing linear or nonlinear impact attenuation mechanism Program can be used for analysis of broad spectrum of impact motion response investigations

**B76-10560****IMPACT OF A SOLID BODY WITH WATER**



## 06 MECHANICS

D A Kross C M Bishop (Boeing Co) B E Clingan (Boeing Co) J R Colson (Boeing Co), C J Heffron (Boeing Co), and C Wiser (Boeing Co)  
Mar 1977

**M-FS-23512** Vol 1, No 4, p 617  
Rigid body three-degrees-of-freedom, digital-simulation program calculates dynamics and loads

### **B76-10561 DESIGN ANALYSIS OF RADIAL-INFLOW TURBINES**

A J Glassman  
Mar 1977

**LEWIS-12684** Vol 1, No 4, p 618  
Computer program performs velocity-diagram analysis required for determining geometry and estimating performance for radial-inflow turbines

### **B76-10562 THERMAL-RADIATION MODEL**

W C Claunch G H Watson (Lockheed Missiles and Space Co) and A L Lee (Lockheed Missiles and Space Co)  
Mar 1977

**M-FS-23538** Vol 1, No 4, p 618  
Central Cartesian coordinate system calculates thermal environment around rocket plume Radiative heat exchange between surfaces is calculated by Monte Carlo method

### **B76-10563 GENERAL INSTABILITY ANALYSIS**

C J Bianca, A A Holston, Jr (Martin Marietta Corp) J R Lager (Martin Marietta Corp) and J M Toth, Jr (Martin Marietta Corp)  
Mar 1977

**M-FS-23407** Vol 1, No 4, p 619  
HOLBOAT computer program provides instability analysis of inhomogeneous, anisotropic right-circular cylinder or segment under combined loading Program is based on Kirchhoff-Love hypothesis general anisotropic constitutive equations and Flugge's differential equations of equilibrium

### **B76-10564 TRANSPOSE OF FINITE-ELEMENT DATA**

T Furuike (Rockwell Intern Corp)  
Mar 1977

**MSC-19644** Vol 1, No 4, p 619  
TRANSPPOSE computer program examines single point of structural-analysis model under many loads Program helps in data reduction and analysis saves output for subsequent postprocessing, and reduces time required for structure analysis Essentially program transposes finite-element data from one loading condition for all element and node data to one-node-point data for all loading conditions

### **B76-10565 ESTIMATING SUBSONIC AERODYNAMIC CHARACTERISTICS OF COMPLEX PLANFORMS**

J E Lamar R J Margason and B B Gloss  
Mar 1977

**LANGLEY-11047** Vol 1, No 4, p 619  
Vortex-lattice FORTRAN program estimates subsonic aerodynamic characteristics of complex planforms and interacting lifting surfaces with separated flow around sharp edges

### **B76-10566 TRIMMED NONCOPLANAR PLANFORMS WITH MINIMUM VORTEX DRAG**

J E Lamar  
Mar 1977

**LANGLEY-12121** Vol 1, No 4, p 620  
Vortex-lattice subsonic method determines mean camber surface for trimmed noncoplanar planforms with minimum vortex drag Multiple surfaces can be designed together to yield trimmed configuration with minimum induced drag at some specified lift coefficient Program is applicable to isolated wings, wing-canard configuration tandem wing and wing-winglet configuration

### **B76-10567 ESTIMATING AIRCRAFT STATES**

R C Wingrove  
Mar 1977

**ARC-10969** Vol 1, No 4, p 620  
Computer program provides weighted least-squares estimates of aircraft states from measurements recorded during routine flight tests Program contains standard six-degree-of-freedom kinematic equations

### **B76-10568 STABILITY OF AN ELASTIC AIRPLANE**

L L Erickson, P P Polentz A Dusto (Boeing Co) G Hink (Boeing Co), and S Shansen (Boeing Co)  
Mar 1977

**ARC-11086** Vol 1, No 4, p 621  
FLEXSTAB computer program is used to evaluate trim state static and dynamic stability characteristics, inertial and aerodynamic loading, and elastic deformations of aircraft configurations at subsonic and supersonic speeds

### **B76-10569 INDEPENDENT TRAJECTORY DETERMINATION SYSTEM**

M G Armstrong and I B Tomaszewski  
Mar 1977

**GSFC-11923** Vol 1, No 4, p 621  
Stand-alone subsystem calculates flight data analytically or numerically System is orbit ephemeris generation program and is subsystem of comprehensive Goddard Trajectory Determination System (GTDS)

## 07 MACHINERY

### **B76-10114 CONCENTRIC-TUBE DIFFERENTIAL DRIVE**

R E Marlow (Sperry Rand Corp)  
Mar 1976

**M-FS-22707** Vol 1, No 1, p 115  
Remote manipulator consists essentially of gear shafts that are placed concentrically with bevel gears located at each joint Teleoperator's advantages include light weight accessibility of parts, continuous rotation of joints, possibility of underwater use, and possibility of miniaturization

### **B76-10115 IMPROVED AUTOMOBILE GAS TURBINE ENGINE**

M G Kofskey T Katsanis, R J Roelke K L McLallin R Y Wong L F Schumann (USAAMRDL) and M R Galvas (USAAMRDL)  
Mar 1976 See also NASA-TM-X-71714 (N75-24106) NASA-TM-X-71717 (N75-21633) NASA-TM-X-71719 (N75-24116)

**LEWIS-12521** Vol 1, No 1, p 116  
Upgraded engine delivers 100 hp in 3500 lb vehicle Improved fuel economy is due to combined effects of reduced weight reduced power-to-weight ratio increased turbine inlet pressure and improved component efficiencies at part power

### **B76-10116 EFFICIENT LOW STATIC-VOLUME WATER HEATER**

R L Brown  
Mar 1976

**M-FS-22469** Vol 1, No 1, p 117  
Calrod heating element is surrounded by matrix of fused sintered copper or brass balls and assembly is then installed in piping of water system As water flows through matrix, sintered balls cause turbulent flow and heating Applications include laundromats laboratories and photographic labs

**B76-10117****CYCLICAL BIODIRECTIONAL ROTARY ACTUATOR**

W C Stange

Mar 1976

**GSFC-11883, GSFC-11974, GSFC-11975 Vol 1, No 1, p 118**

Thermally powered device flips magnetometer between one of two positions located 180 deg apart and permits instrument calibration. Pair of heat-extensible springs selectively rotate shaft from one position to other when electric heaters bonded to them are energized.

**B76-10118****FIELD SAMPLING FINE-VACUUM SYSTEM**

E W Fickey (Bendix Corp) and D M Smoot (Bendix Corp)

Mar 1976

**KSC-10596 Vol 1, No 1, p 119**

Small portable pumping station, consisting of roughing pump, air cooled diffusion pump, and liquid nitrogen cold trap, permits onsite sampling followed by quantitative laboratory analysis of residual gases.

**B76-10119****INTEGRAL FAN/WATER SEPARATOR**

R L Johnson (Garrett Corp)

Mar 1976

**MSC-14756 Vol 1, No 1, p 120**

Centrifugal force created by rotating fan wheel separates moisture from gas. Lightweight portable unit can be worn with pressurized suit where it will remove moisture that accumulates from breathing and perspiration.

**B76-10120****CROSSWIND LANDING-GEAR POSITION INDICATOR**

R A Champine

Mar 1976

**LANGLEY-11941 Vol 1, No 1, p 121**

Position indicator for airplanes equipped with adjustable or automatic crosswind landing-gear systems prevents wheel misalignments.

**B76-10121****POINTING CONTROL/ROLL POSITIONING MECHANISM**

W E Kohman (Perkin-Elmer Corp)

Mar 1976

**M-FS-22809 Vol 1, No 1, p 122**

Telescope mount provides torquing for a fine-pointing servosystem in both pitch and yaw. Use of flexure bearings in EPC (experiment pointing control) actuator package offers performance and reliability superior to that of other bearing configurations.

**B76-10122****HAND FIN FOR SWIMMING**

H L Martin

Jun 1977

**M-FS-21632 Vol 1, No 1, p 123**

Paddle mounted on forearm aids propulsion and maneuverability and frees hand for work without interference.

**B76-10244****TOOL REMOVES BRAZED FITTINGS**

W J Hurley (Martin Marietta Corp) and S E Nelson (Martin Marietta Corp)

Aug 1976

**LANGLEY-10944 Vol 1, No 2, p 253**

Device which removes fittings from thin-walled tubing will not accidentally bond to fitting, nor will it cause tube wall to melt. Key feature is the use of expendable split-ring heat sink insert. Technique is applicable to fitting stubs of all sizes and wall thicknesses.

**B76-10245****MECHANICAL POSITIONER**

G A Tuthill (Rockwell Intern Corp) and G O Magnusson (Rockwell Intern Corp)

Aug 1976

**MSC-15817****Vol 1, No 2, p 254**

Manually controlled positioner designed for castor wheels on heavy equipment employs self-engaging self-releasing friction cam that engages with and moves wheel. Adjustable stops control degree of pressure exerted on wheel, and lock pin holds device in neutral steering configuration.

**B76-10246****RADIAL LEVEL**

D L Posey

Aug 1976

**LANGLEY-11982 Vol 1, No 2, p 255**

Actual angle indicator is a liquid captured inside cylindrical transparent tube that is radially mounted around or under 360 deg scale. Device is functional and accurate within full 360 deg spectrum and instantly determines any surface angle without making adjustments since it has no moving parts.

**B76-10247****SPLIT-RING SEAL**

E A Gallo (Kentrion Hawaii Ltd)

Aug 1976

**MSC-14304 Vol 1, No 2, p 256**

Gland-type seal may be used with hydraulic and pneumatic actuators and similar equipment. It is designed for applications with partial vacuums and requires little space for installation and infrequent servicing.

**B76-10248****ROTARY BROACHES**

C Libertone (Rockwell Intern Corp)

Aug 1976

**M-FS-23374 Vol 1, No 2, p 257**

Tool is used for counterboring or backspot facing recesses for boltheads or nuts in difficult-to-reach locations, such as near webs, bosses or flanges. Two versions of tool have been designed, one for roughing out and another for finishing.

**B76-10249****VEHICLE LOAD-EQUALIZATION SYSTEM**

W K Creasy

Aug 1976

**MSC-12466 Vol 1, No 2, p 258**

System uses cables and associated pulleys to form closed-loop suspension system for terrain compensation. Loop causes reactions at each of three wheels in response to loading at remaining wheel. Simplicity of design should be of interest to designers and manufacturers of construction equipment and off-road vehicles.

**B76-10250****LARGE-DIAMETER FASTENERS OF CRES ALLOY**

J F Charles (Rockwell Intern Corp) and M L Marke (Rockwell Intern Corp)

Aug 1976

**MSC-19313 Vol 1, No 2, p 259**

Double-hex bolthead allows bolts of high strength corrosion-resistant steel (CRES) to be made in diameters up to 1-1/4 in. Design allows 12-point tension heads to be cold formed to retain required minimum tensile strength of 220 000 psi and to retain high fracture strength.

**B76-10251****HIGH-TEMPERATURE HEATING ARRAY**

H E Christensen (McDonnell-Douglas Corp) and B G Cox (McDonnell-Douglas Corp)

Aug 1976

**MSC-14287 Vol 1, No 2, p 260**

Heating array for thermally conditioning reusable surface insulation panels of thermal protection systems is capable of heating samples to 2500 F at pressures ranging from 0.5 to 760 torr. System uses low cost, easily replaceable graphite heating elements which give more uniform heating than quartz lamps.

**B76-10252****LOAD-REGULATING LATCH**

## 07 MACHINERY,

W T Appleberry (Rockwell Intern Corp)  
Aug 1976

**MSC-19535**

**Vol 1, No 2, p 261**

Device is designed for remotely latched doors or for doors on which latch cannot be reached for adjustment after door is closed. It automatically regulates latch tension load, prevents overload and load shares in multiple latch system.

**B76-10253**

**SOLAR CONCENTRATOR/ABSORBER**

G F VonTiesenhausen

Aug 1976

**M-FS-23428**

**Vol 1, No 2, p 262**

Collector/energy converter consisting of dual-slope optical concentrator and counterflow thermal energy absorber is attached to multiaxis support structure. Efficient over wide range of illumination levels, device may be used to generate high temperature steam, serve as solar powered dryer or power absorption cycle cooler.

**B76-10254**

**PROPOSED LOW-TEMPERATURE SOLAR ENGINE**

J A Peoples and G B Kearns

Aug 1976

**M-FS-23403**

**Vol 1, No 2, p 263**

Engine, proposed for conversion of Sun's heat to motion without need for heat pumps and associated equipment, uses expansion and contraction of aluminum rod to drive tow-out-of-phase windlasses. Linear displacement of 0.076 cm in rod will exert sufficient force to drive pumps, generators and compressors.

**B76-10255**

**CONICAL DIFFUSER FOR FUEL CELLS**

D W Craft (GE)

Aug 1976

**MSC-14026**

**Vol 1, No 2, p 264**

Diffuser is inserted into inlet manifold, producing smooth transition of flow from pipe diameter to manifold diameter. Expected pressure gradient and resulting cell-to-cell temperature gradient are reduced. Outlet manifold has nozzle insert that reduces exit losses.

**B76-10256**

**HORIZONTALLY-MOUNTED SOLAR COLLECTOR**

D H Black

Aug 1976

**M-FS-23349**

**Vol 1, No 2, p 265**

System consists of three major components: vertical deflector assembly, stationary reflector and motor driven tracking mechanism. Deflector assembly directs incident incoming energy to a vertical direction, using series of horizontally mounted vanes. Energy is then redirected via reflector to fixed collector.

**B76-10257**

**HAND AND POWER TOOLS**

Innovator not given. Aug 1976. See also NASA-SP-5976(06)

**HQN-10892**

**Vol 1, No 2, p 266**

Report contains descriptions of twenty-five tools and tooling advancements developed for industrial and small machine shop adaptation.

**B76-10405**

**HIGH-TORQUE OPEN-END WRENCH**

H Behimer, J M Dame and A Giandomenico

Jan 1977

**NPO-13541**

**Vol 1, No 3, p 437**

Two-element tool is designed for tightening closely-spaced nuts on adjacent tubing.

**B76-10406**

**FRAME FOR DAYLIGHT PHOTOCOPYING**

J W Dalton

Jan 1977

**KSC-11026**

**Vol 1, No 3, p 438**

Inexpensive fixture makes quick copy of picture or photograph.

film positive or negative without darkroom. Device holds four-by-five inch instant-developing Polaroid 58 or 55 (or equivalent) film.

**B76-10407**

**SLOTTED BOLTS AND STUDS FOR VACUUM SYSTEMS**

F E Zellner

Jan 1977

**LEWIS-10391**

**Vol 1, No 3, p 439**

Modified device reduces outgassing from installed fixtures.

**B76-10408**

**SOFT SEAT A-N FITTING FOR VACUUM USE**

A B Szuhai

Jan 1977

**LEWIS-10130**

**Vol 1, No 3, p 439**

Commercially available fittings are modified to produce leaktight connections at low cost.

**B76-10409**

**PRECISION CENTERING VISE**

J A Thompson (Bendix Corp)

Jan 1977

**KSC-11041**

**Vol 1, No 3, p 440**

Lightweight device automatically aligns stainless-steel tubing and fittings regardless of differing diameters prior to joining via induction brazing. Device is useful in remote areas where existing supports or walls cannot be used to anchor tubing holder.

**B76-10410**

**SUSTAINED-ARC IGNITION SYSTEM**

A G Birchenough

Jan 1977

**LEWIS-12444**

**Vol 1, No 3, p 440**

Process results in long-duration sparks which allow leaner, cleaner combustion. Procedure is not limited by available energy-storage devices and can produce continuous spark of as long duration as desired for optimum engine operation and pollution reduction. System can be modified to operate on engines not using distributor points and can be used with conventional Kettering ignitions.

**B76-10411**

**POWERED WHEEL FOR AIRCRAFT**

M J Long, S C Irick and R K VanAusdal (Bendix Corp)

Jan 1977. See also B75-10258

**LANGLEY-12053**

**Vol 1, No 3, p 441**

Single integral unit includes motor, gearbox, and clutch. Device has two-speed capability, fits within aerodynamic contours of aircraft, operates with onboard power source, does not interfere with normal landing gear functions, reduces use of regular brakes in congested areas and provides locomotion and supplementary braking capability.

**B76-10412**

**SAFETY BRAKE FOR TAPE REELS**

C E Carle

Jan 1977

**GSFC-11960**

**Vol 1, No 3, p 442**

All-mechanical device senses end of tape and stops reel, even in event of electronic system failure. Assembly includes stop to prevent brake from overriding tape. Recentering mechanism returns brake to neutral position after torque is removed from reels.

**B76-10413**

**IMPROVED ROAD HANDLER**

P H Broussard, Jr, J L Burch and C Mueller

Jan 1977

**M-FS-23233**

**Vol 1, No 3, p 443**

Rope-and-pulley device unwinds at rate fairly independent of weight attached to it. Device is easily installed and fabrication is economical. It is particularly suitable as emergency escape device.

**B76-10414****DOOR LATCH WITH THROUGH-ACCESS HOLE**

W F Dixon (Rockwell Intern Corp), R P Pritchard (Rockwell Intern Corp), and R E Woodfill (Rockwell Intern Corp)  
Jan 1977

**MSC-19634****Vol 1, No 3, p 444**

Innovation allows fully-loaded container to be fastened to rear wall of recessed area. Assembly is designed to carry shear and tension loads. Retractable handle allows for visual verification if door is locked or unlocked.

**B76-10415****GAS BOOST COMPRESSOR**

L S Terp (Garrett Corp)  
Jan 1977

**MSC-14757****Vol 1, No 3, p 445**

Device, driven by low pressure gas supply, requires fewer controls and valves than conventional devices. Device can boost compression four times initial pressure.

**B76-10416****DYNAMIC LOAD ATTENUATOR**

P N Crum (Rockwell Intern Corp)  
Jan 1977

**MSC-17472****Vol 1, No 3, p 446**

Instrument consists of special bolt head that cuts material from splined washer. Required shear and tensile forces absorb kinetic energy. Cut-away material is retained by shearing action making device useful where production of loose metal particles is not acceptable.

**B76-10417****SPIN-RATE CONTROL DEVICE**

L J Nolte (Hughes Aircraft Co)  
Jan 1977

**ARC-10884****Vol 1, No 3, p 446**

Innovation eliminates need for driver sensor and interconnecting logic circuits. Device combines simplicity of fixed-fin concept with precise rate control provided by active flight control system.

**B76-10418****HEAVY-DUTY MECHANICAL SEQUENCER**

W T Appleberry (Rockwell Intern Corp)  
Jan 1977

**MSC-19536****Vol 1, No 3, p 448**

Modular sequential mechanism allows output stroke angle and location of start/stop points to be pre-programmed. Output torques are higher than typical Geneva mechanisms. They are constant throughout cycle, and have a moment equal to that of power source.

**B76-10419****ENERGY-ABSORBING ATTENUATOR**

P Galovich (Rockwell Intern Corp) and J C Wilkowski (Rockwell Intern Corp)  
Jan 1977

**MSC-17473****Vol 1, No 3, p 449**

Simple inexpensive one-shot load device uses thin-walled soft-metal tube to absorb kinetic energy by controlled buckling.

**B76-10420****JET ENGINE STATOR-BLADE REMOVAL TOOL**

D D Diamond (Serv-Air, Inc)  
Jan 1977

**MSC-16000****Vol 1, No 3, p 450**

Instrument removes individual stator-blade segments from J-85 jet engine without deforming blade or engine casing.

**B76-10570****NASA TECHNOLOGY UTILIZATION HOUSE**

Innovator not given Mar 1977

**LANGLEY-12134****Vol 1, No 4, p 625**

Following systems and features which are predicted to save approximately \$20,000 in utility costs over twenty year period are incorporated into single-level contemporarily designed energy

efficient residential structure solar heating and cooling energy efficient appliances water recycling security, smoke and tornado detectors, and flat conductor electrical wiring.

**B76-10571****ECONOMICAL SOLAR-HEATING FOR HOMES**

J W Allred J M Shinn, Jr C E Kirby and S R Barringer  
Mar 1977 See also NASA-TM-X-3294 (N76-27671)

**LANGLEY-12135****Vol 1, No 4, p 626**

Do-it-yourself supplementary solar-heating system is available for purchase at approximately \$2,000. Report describes design, construction testing and economic analysis of low-cost solar heating system.

**B76-10572****LEVELING APPARATUS FOR PRECISION INSTRUMENTS**

R W Delaplaine and D L Ossolani  
Mar 1977

**ARC-10981****Vol 1, No 4, p 627**

Simple inexpensively-constructed device provides shock-and-vibration-resistant support.

**B76-10573****LOW-PRESSURE-GAS SAMPLING PUMP**

P L Fontecchio (Metal Bellows Corp)  
Mar 1977

**ARC-10941****Vol 1, No 4, p 628**

Bellows pump raises sampled-gas pressure to level compatible with available compressors.

**B76-10574****DISPENSING A MEASURED QUANTITY OF A LIQUID**

T A Cook (McDonnell-Douglas Corp) and H Cheibe (McDonnell-Douglas Corp)  
Mar 1977

**M-FS-21163****Vol 1, No 4, p 629**

Hand-held pushbutton-controlled dispenser ejects predetermined amount of fluid. Each cycle is recorded on counter. All seals in contact with cooler are food grade. No maintenance is required during life of unit.

**B76-10575****OMNIDIRECTIONAL WHEEL**

J F Blumrich  
Mar 1977

**M-FS-21309****Vol 1, No 4, p 630**

Device with rotating rim elements provides mobility in any direction for ground vehicle without requiring change of orientation relative to vehicle.

**B76-10576****LONG-LIFE BALL-VALVE DESIGN**

D F Ferris (Rockwell Intern Corp) and W A Gillon, Jr (Rockwell Intern Corp)  
Mar 1977

**M-FS-19282****Vol 1, No 4, p 631**

Eccentric mounting of ball on stem reduces wear on valve seal.

**B76-10577****RECORDING-TAPE POSITION SENSOR**

G C Schoppet  
Mar 1977

**GSFC-12056****Vol 1, No 4, p 631**

Device uses tachometer pulses from capstan and reset pulse from one reel to sense count of tach pulses per revolution of reel. Number of pulses is direct measurement of tape stack radius and is independent of tape speed or direction.

**B76-10578****IMPROVED SHELF FOR ELECTRONIC MODULES**

R A Marzek  
Mar 1977

**NPO-13158****Vol 1, No 4, p 632**

Self-aligning slide assembly improves air flow. Alignment accuracy is incorporated into assembly at time of fabrication.

reducing requirement for mounting-hole location accuracy Amount of labor needed for installation necessary machining hardware, and number of mounting points are reduced from previous support system Load-bearing capability is built into mounting platform

## 08 FABRICATION TECHNOLOGY

**B76-10123**

### LOW-COST SOLAR REFLECTORS

M J Argoud J Jolley, and W L Walker  
Mar 1976

**NPO-13707**

Vol 1, No 1, p 125

Foamed glass provides an inexpensive lightweight substrate for reflective elements used in solar energy converters Material withstands temperature from -450 to 800 degrees Fahrenheit and pressures up to 100 psi

**B76-10124**

### BATTERY-CELL THERMAL TEST FACILITY

J A Sanders (Martin Marietta Corp)  
Mar 1976

**M-FS-23040**

Vol 1, No 1, p 126

Vacuum-enclosed system is used to analyze instantaneous thermal and electrical characteristics of batteries Data can be used to determine efficiency and provide for more effective utilization of available power

**B76-10125**

### UNIFORM SOLAR CELLS

Innovator not given (Northrop Serv, Inc) Mar 1976

**GSFC-11941**

Vol 1, No 1, p 127

Solar cells used in radiation sensors can be efficiently matched by individual trimming Strip of aluminized Mylar is used to adjust cell output to within required tolerances Method is faster than individual selection of matched cells

**B76-10126**

### STOPPING SMALL LIQUID LEAKS

C R Gilley (Boeing Co) and J R Schanbacher (Boeing Co)  
Mar 1976

**KSC-10667**

Vol 1, No 1, p 127

Technique helps locate minute liquid leaks in fittings of petroleum-base fuels

**B76-10127**

### COMBINED JOINING PROCESS FOR DISSIMILAR METALS A CONCEPT

C S Beuyukian (Rockwell Intern Corp) and M J Mitchell (Rockwell Intern Corp)  
Mar 1976

**MSC-19323**

Vol 1, No 1, p 128

Combined brazing and diffusion bonding process for aluminum and stainless steel saves time and simplifies processing Tests show that resulting bond can withstand internal pressures up to 1 000 psi

**B76-10128**

### NONDESTRUCTIVE INSPECTION OF MULTILAYERED INSULATION

J A Zelik (McDonnell-Douglas Corp)  
Mar 1976

**M-FS-22191**

Vol 1, No 1, p 129

Radio frequency techniques are used to evaluate multilayered cryogenic insulation Electromagnetic inspection approach assesses metal loss and layer density

**B76-10129**

### RELIABILITY OF HYBRID MICROCIRCUIT BONDING

S V Caruso D L Kinser S M Graff and R V Allen  
Mar 1976

**M-FS-23358**

Vol 1, No 1, p 130

Microcircuit failure due to differential thermal expansion depends on technique used to mount components to substrate Effects of differential thermal expansion on ceramic chip capacitors are investigated for various bonding techniques

**B76-10130**

### ROLL-FORMING TUBES TO HEADER PLATES

K Kramer  
Mar 1976

**LEWIS-10513**

Vol 1, No 1, p 131

Technique has been developed for attaching and sealing tubes to header plates using a unique roll-forming tool Technique is useful for attaching small tubes which are difficult to roll into conventional grooves in header plate tube holes and for attaching when welding brazing, or soldering is not desirable

**B76-10131**

### METAL STRUCTURES WITH PARALLEL PORES

J M Sherfey  
Mar 1976

**GSFC-10984**

Vol 1, No 1, p 132

Four methods of fabricating metal plates having uniformly sized parallel pores are studied elongate bundle wind and sinter extrude and sinter and corrugate stack Such plates are suitable for electrodes for electrochemical and fuel cells

**B76-10132**

### METALWORKING METHOD FOR COMPOSITES

A P Divecha (Commonwealth Sci Corp)  
Mar 1976

**M-FS-23354**

Vol 1, No 1, p 133

Effective fabrication methods for aluminum/boron and aluminum/graphite composites have been investigated Drawing and rolling were found to be adaptable to Al/B fabrication Although graphite composites are not amenable to standard metal processing methods it may be possible to reduce fabrication costs of Al/C through electron-beam heating

**B76-10258**

### RF SHAPING OF SILICON RIBBON

D A Pelhank (McDonnell-Douglas Corp) R D Rochat (McDonnell-Douglas Corp) and W Marx (McDonnell-Douglas Corp)  
Aug 1976

**M-FS-23424**

Vol 1, No 2, p 269

Electromagnetic force generated by radiofrequency coil is used to shape molten silicon Shaping coil surrounds melt near solid-liquid interface and induces current in surface region of melt nearly equal to but opposite coil current

**B76-10259**

### IGFET/SOI FABRICATION METHOD

W R Feltner  
Aug 1976

**M-FS-23312**

Vol 1, No 2, p 270

Technique increases switching speeds shortens channel length, reduces parasitic capacitance and gate overlap and minimizes gate-to-channel capacitance The p and n sections may be reversed allowing fabrication of complementary devices

**B76-10260**

### SOLAR CELL ELECTRICAL CONNECTIONS

H S Rauschenbach (TRW Inc) and H G Mesch (TRW Inc)  
Aug 1976

**LEWIS-12293**

Vol 1, No 2, p 272

Study was conducted to find best methods of attaching pure silver and silver plated Kovar (trademark) interconnect ribbons to silicon solar cells with titanium-silver solderless contacts Investigations include thermocompression bonding parallel-gap welding and ultrasonic welding

**B76-10261**

### EPITAXIAL GROWTH OF GA1-XALXAS ON GAP

J M Woodall (IBM) and G I Farmer (IBM)  
Aug 1976

**GSFC-11826** Vol 1, No 2, p 274

Technique suitable for monolithic device fabrication methods permits growth of LED structures on GaP substrates by liquid-phase epitaxial method thus obviating needs for growing thick layers and for removing substrates. High efficiency infrared LEDs can be developed as pumping sources for Nd YAG lasers

**B76-10262**  
**METHOD OF REMOVING DRILLING CHIPS**

F E Ransom (Rockwell Intern Corp)

Aug 1976

**M-FS-19235** Vol 1, No 2, p 275

Special chuck directs mixture of pressurized air and water through drill bit thus removing chips during boring of long, large diameter holes

**B76-10263**  
**POLISHING GOLD AND GOLD-ALLOY CRYSTALS**

J P Doty (Eagle-Picher Ind Inc)

Aug 1976

**M-FS-22800** Vol 1, No 2, p 276

Sawed cross-section samples are rough polished at minimum pressure with 14 micron grit. After saw marks are polished away polishing grit is changed to 0.05 micron. When smooth appearance is attained surface is then chemically polished by hand in dust free room

**B76-10264**  
**SOLDERING HIGH-IMPEDANCE NICHROME WIRE**

M Spruill (Rockwell Intern Corp) and P R Callen (Rockwell Intern Corp)

Aug 1976

**M-FS-1457** Vol 1, No 2, p 276

Nickel wire segment allows Nichrome wire to be soldered without changing its electrical characteristics

**B76-10265**  
**DIFFUSION BRAZING NICKEL-PLATED STAINLESS STEEL**

C S Beuyukian (Rockwell Intern Corp) and M J Mitchell (Rockwell Intern Corp)

Aug 1976

**MSC-19322** Vol 1, No 2, p 277

To bond parts sandwich assembly is made up of aluminum core aluminum face sheet with brazing alloy interface and nickel plated stainless steel part. Sandwich is placed between bottom and top glide sheet that is placed in stainless steel retort where assembly is bonded at 580 C

**B76-10266**  
**ULTRA-LIGHTWEIGHT PRESSURE VESSELS**

W W Schmidt (Brunswick Corp) and R O Hawkins (Brunswick Corp)

Aug 1976

**MSC-14983** Vol 1, No 2, p 278

Composite tanks fabricated from two metal spheres which are pressure welded and then overwrapped with plastic composite are 66 percent lighter than similar all-metal vessels. Overwrap minimizes shrapnel effects shifts failure mode to that of cyclic leakage and withstands minimum burst pressure

**B76-10267**  
**STRIPPER FOR SILICONE POLYMERS**

B B Williams (Rockwell Intern Corp)

Aug 1976

**MSC-19380** Vol 1, No 2, p 278

Potassium hydroxide in ethyl alcohol solution can strip away coatings adhesives and encapsulants without damaging substrates

**B76-10268**  
**IMPROVED PHOTOCHEMICAL ETCHING OF STAINLESS STEEL**

G E Lotgering (Rockwell Intern Corp)

Aug 1976

**MSC-19728** Vol 1, No 2, p 279

Improved process yields tougher and more adherent coating

that withstands longer exposure to acid etch spray without cracking or flaking and permits etching to depth of 0.127 cm

**B76-10269**  
**ELECTRON-BEAM WELDER ALINEMENT**

E L Whiffen (Rockwell Intern Corp)

Aug 1976

**MSC-19642** Vol 1, No 2, p 279

Parts are easily and quickly positioned in welding vacuum chamber with use of inexpensive thin metal-foil plate

**B76-10270**  
**OVERHEAD TRAY FOR CABLE TEST SYSTEM**

K T Saltz (Rockwell Intern Corp)

Aug 1976

**MSC-19488** Vol 1, No 2, p 280

System consists of overhead slotted tray series of compatible adapter cables, and automatic test set which consists of control console and cable-switching console. System reduces hookup time and also reduces cost of fabricating and storing test cables

**B76-10271**  
**3-D FOAM ADHESIVE DEPOSITION**

C R Lemons (McDonnell-Douglas Corp) and O K Salmassy (McDonnell-Douglas Corp)

Aug 1976

**M-FS-22739** Vol 1, No 2, p 281

Bonding method which reduces amount and weight of adhesive is applicable to foam-filled honeycomb constructions. Novel features of process include temperature-viscosity control and removal of excess adhesive by transfer to cellophane film

**B76-10272**  
**SYNCHRONIZED BACKSIDE-WELD FOLLOWER**

W F Iceland (Rockwell Intern Corp) and W M Beaupre (Rockwell Intern Corp)

Aug 1976

**M-FS-24454** Vol 1, No 2, p 282

For curved-path tracking with respect to power input side system employs two sets of infrared detectors on droptrough side for sensing. First set functions with closed-loop motor control system in azimuthal direction and second set with its closed-loop motor control system positions elevation

**B76-10273**  
**ABLATIVE-FILLED HONEYCOMB COMPOSITES**

H L Linebarier (Martin Marietta Corp)

Aug 1976

**LANGLEY-11180** Vol 1, No 2, p 283

Two techniques reduce fabrication cost and complexity. Net surface molding permits ablatives insulators with sculptured tapers to be produced over substrate having unpredictable irregularities. Subsurface molding results in ablatives surface below honeycomb

**B76-10274**  
**COMPOUND SOLDER JOINTS**

R I Batista (TRW Inc) and R B Simonson (TRW Inc)

Aug 1976

**LANGLEY-11444** Vol 1, No 2, p 284

Joining technique prevents contamination may be used to join dissimilar metal tubes minimizes fluid and gas entrapment expedites repairs and can yield joints having leakage rates less than 0.000001 standard cubic cm He/min. Components of joint are solder sleeve two solder rings Teflon sleeve and tubing to be joined

**B76-10275**  
**CLEANING CARBON STEEL**

V Maynard (Bendix Corp)

Aug 1976

**KSC-10689** Vol 1, No 2, p 285

Increased etch rate using 8% citric acid actually reduces total amount of material etched away by eliminating reprocessing that was frequently required. Time required in citrosolve solution is reduced and more protective passive coating is provided

## 08 FABRICATION TECHNOLOGY

**B76-10276**

### REPAIR OF FUSED SILICA PLATENS

R M Heisman (Rockwell Intern Corp) and C S Beuyukian (Rockwell Intern Corp)

Aug 1976

**MSC-19713**

**Vol 1, No 2, p 286**

Refill/leveling technique which consists of spreading slurry refill material to affected areas and then sanding until surfaces are flat extends service life of platen up to 50 production cycles between downtime

**B76-10277**

### FLEXIBLE FITTING FOR FLUID LINES

S L Barajas (Rockwell Intern Corp)

Aug 1976

**MSC-17780**

**Vol 1, No 2, p 287**

Tube fitting, consisting of movable tubular section containing two spring pressure Teflon actuated low friction seals two standard connectors and two hexagonal retaining nuts, provides flexible joint that allows axial and rotational motion

**B76-10278**

### BOROSILICATE GLASS-TO-KOVAR TUBE BONDING

R F Harris

Aug 1976

**GSFC-12077**

**Vol 1, No 2, p 288**

Two-micron-diameter inlet leak, useful in mass spectrometry applications minimizes gas sample distortion that occurs between sample and leak is easily joined to spectrometer inlet system and withstands unusual gas pressures and temperatures

**B76-10279**

### TECHNIQUE FOR JOINING METAL TUBING

H W Wright (TRW Inc)

Aug 1976

**ARC-10946**

**Vol 1, No 2, p 289**

Uniform wall thickness and uninterrupted heat transfer are achieved by using shaped metal insert as wall material for joint. Insert acts as support during brazing after which excess material is ground away to bring joint to original tubing size

**B76-10280**

### BRAZE/REBRAZE PROCESS FOR CRES STEEL

C E Silverman (Rockwell Intern Corp)

Aug 1976

**MSC-19600**

**Vol 1, No 2, p 289**

Using induction brazing process with 85-Au/16.5-Cu/2.0-Ni braze alloy joints in 21-6-9 CRES steel tubing can be reworked up to seven times thus significantly reducing cost of fabrication repair and part replacement

**B76-10281**

### AGE-FORMING ALUMINUM PANELS

G I Baxter (General Dynamics Corp)

Aug 1976

**MSC-12648**

**Vol 1, No 2, p 290**

Contoured-stiffened 63 by 337 inch 2124 aluminum alloy panels are machined in-the-flat to make integral tapered T-capped stringers, parallel with longitudinal centerline. Aging fixture, which includes net contour formers made from lofted contour templates has eggcrate-like structure for use in forming and checking panels

**B76-10282**

### FRACTURE MECHANICS FOR WELD ACCEPTANCE

C A Bolstad (Martin Marietta Corp) and L W Loechel (Martin Marietta Corp)

Aug 1976

**M-FS-23360**

**Vol 1, No 2, p. 291**

Criteria include specifications for allowable cracklike defect lengths undercut, underfill suckback mismatch, peaking in butt welds, root penetration weld beam dimensions lap joint dimensions and acceptable defect sizes and densities for double and single fillet welds

**B76-10283**

### MACHINING TITANIUM ALLOYS

I A Sutherland

Aug 1976

**M-FS-23006**

**Vol 1, No 2, p 291**

Study suggests ways of reducing chatter, increasing productivity, and reducing tool wear. Report also describes static and dynamic cutting tests and tool materials and finishes

**B76-10284**

### ANNEALING STRAINED ALLOY 718

T J Morrison (Rockwell Intern Corp)

Aug 1976

**M-FS-19242**

**Vol 1, No 2, p 292**

Report shows that grain coarsening in Alloy 718 can result in greatly reduced resistance to weld-heat-produced zone fissuring, especially when final grain size is ASTM 2. Tensile tests and metallographic examination of bend test specimens provide necessary data

**B76-10421**

### MODULAR MULTIPURPOSE PANEL SUPPORT

M R Daun (Rockwell Intern Corp) and L A Maring (Rockwell Intern Corp)

Jan 1977

**MSC-19641**

**Vol 1, No 3, p 453**

Inexpensive set of modular semirigid box structures serve as multipurpose support for thin panels. Fixture holds several different interchangeable two-part adjustable contour-board subassemblies. Combining modules allows for accommodation to any length skin or panel

**B76-10422**

### CONTAINERLESS PROCESSING OF TUNGSTEN

N Beser (GE) R T Frost (GE) E C OKress (GE), D J Rutecki (GE) and G Wouch (GE)

Jan 1977

**M-FS-23509**

**Vol 1, No 3, p 454**

Simultaneous electromagnetic levitation and electron-beam heating allow contaminationless melting of tungsten. Possible application for this technique is production of X-ray targets

**B76-10423**

### ACOUSTIC-ENERGY SHAPING OF MELTABLE METALS

D D Elleman and T G Wang

Jan 1977

**NPO-13802**

**Vol 1, No 3, p 455**

Containerless shaping technique is applicable to machining metals technology. Process improves quality of melted metals by reducing introduction of impurities from container walls or floor

**B76-10424**

### ALL-TANTALUM ELECTROLYTIC CAPACITOR

G E Green Jr (Aerotron Inc)

Jan 1977

**M-FS-23462**

**Vol 1, No 3, p 456**

Device uses single-compression tantalum-to-tantalum seal. Single-compression seal allows better utilization of volume within device. As result of all-tantalum case and lengthened cathode electrical parameters, particularly equivalent series resistance and capacitance stability improved over silver-cased capacitor

**B76-10425**

### LOW-PRESSURE LOW-TEMPERATURE MOLDING PROCESS

E L Bowman (Rockwell Intern Corp)

Jan 1977

**MSC-19778**

**Vol 1, No 3, p 457**

Use of expanding rubber mandrel allows for bonding of graphite/epoxy laminated parts in oven instead of expensive autoclave. Heavy-duty two-piece aluminum mold limits deflection. Manipulation of resin contact by precise control of mandrel-generated pressure eliminates complex bleeder system

**B76-10426**

### FUEL-CELL POWERPLANT INSULATION

R J Guthrie (United Technologies Corp)

Jan 1977

**MSC-16012** Vol 1, No 3, p 458

Multilayer lightweight, flexible, thermal blanket is optimized for minimum weight and heat loss

**B76-10427**

**REDUCED COSTS FOR SOLAR-CELL MODULES**

A F Forestieri and E Anagnostou

Jan 1977

**LEWIS-12185** Vol 1, No 3, p 459

Production expenses are decreased by embossing encapsulating plastic film to position and secure cells Electric circuit is printed on plastic film simultaneously with cell encapsulation process Procedure can be used with standard-contact and wraparound contact cells

**B76-10428**

**IMPROVED BONDING OF HONEYCOMB PANELS**

S A Sobkiewicz (Rockwell Intern Corp)

Jan 1977

**MSC-19560** Vol 1, No 3, p 459

Technique using angular metal braces bonded onto panels lowers construction costs Technique improves overall structural strength decreases assembly time, and avoids wear points created by bolts and rivets

**B76-10429**

**FABRICATION AND APPLICATIONS OF ELECTRETS**

P K C Pillai and E L Shriver

Jan 1977

**M-FS-23437** Vol 1, No 3, p 460

Permanently charged dielectrics can be made less expensively faster and more effectively using improved techniques and materials Methods include charge injection Tesla-coil charging and molten spray Possible uses include pollution control low-power sensors and illumination control

**B76-10430**

**CLEANING LARGE TANKS AND GAS BOTTLES**

I D Smith (White Sands Test Facility)

Jan 1977

**MSC-14966** Vol 1, No 3, p 461

Distillation technique using vapor solvent trichloromonofluoromethane is economical effective and eliminates need to enter tank thus reducing risk of further contamination Solvent can be purified for reuse

**B76-10431**

**GRAPHICAL METHODS FOR VARIABLE SAMPLING PLANS**

K Teramura (Rockwell Intern Corp)

Jan 1977

**MSC-19279** Vol 1, No 3, p 462

Simplified technique can be done quickly and without machine assistance Method provides more accurate quality-level information for given sample sizes

**B76-10432**

**CONTROLLED LINEAR CLAMPER/LOADER**

R M Steudl

Jan 1977

**GSFC-12105** Vol 1, No 3, p 463

Pneumatic fixture can be used to clamp odd-shaped parts to non-uniform surface Device can be made from nonmagnetic materials for use in magnetic field test environments It also applies uniform load over clamped surface

**B76-10433**

**HOT-WIRE TILE REMOVAL TOOL**

J W Holt (Rockwell Intern Corp)

Jan 1977

**KSC-11043** Vol 1, No 3, p 464

Cheesecutterlike device uses electrically heated wire to slice through thermosetting embedment Technique does not damage tile or create unwanted debris in work area

**B76-10579**

**FORMING HARD ALUMINUM IN COMPLEX SHAPES**

I J Wilson (Rockwell Intern Corp)

Mar 1977

**MSC-19693** Vol 1, No 4, p 635

Three step procedure consisting of annealing cold working and precipitation heat treatment converts soft temper aluminum to T8 aluminum

**B76-10580**

Vol 1, No 4, p 636

**ELECTRIC HEATING FOR METAL SURFACE HARDENING**

N L Lockman (Rockwell Intern Corp)

Mar 1977

**M-FS-19268**

Electrical element heats only desired area and permits precise control of temperature and cooling rate Process serves as alternative to flame hardening for treating localized areas

**B76-10581**

**YIELD-PRESSURE DETERMINATION**

M E Wakefield (Martin Marietta Corp)

Mar 1977

**MSC-14655** Vol 1, No 4, p 636

Stress/strain relationship of complex-shape vessel is recorded under hydrostatic pressure Technique is used to test pressurized gas cylinders and tubular transition joints made of dissimilar metals and to determine burst or system-failure pressures

**B76-10582**

**CRYSTAL ORIENTATION FOR SOLID-STATE PHOTO LITHOGRAPHY**

D P Marinelli (RCA)

Mar 1977

**LANGLEY-11940** Vol 1, No 4, p 637

Method determines desirable direction to apply photoresist mask when fabricating semiconductor lasers Method can be applied to finished wafer without affecting device yield

**B76-10583**

**PARYLENE COATING FOR CIRCUIT COMPONENTS**

M J Berkebile R J Holbrook (Hughes Aircraft Co) and F W Oberin (Hughes Aircraft Co)

Mar 1977

**M-FS-23450** Vol 1, No 4, p 638

Inexpensive internal coating improves reliability of plastic-packaged parts Coating protects device from effects of humidity and heat and acts as barrier between device and harmful substances generated by plastic-packaging material

**B76-10584**

**INEXPENSIVE TAGS FOR TUBES OR CABLES**

A J Fakolt

Mar 1977

**LEWIS-12676** Vol 1, No 4, p 638

Split brass paper fasteners are used to identify tubes and cables in environments in which standard adhesive-backed identification tags do not adhere

**B76-10585**

**RIGID CABLE SUPPORT FOR BLIND INSTALLATIONS**

J R Abbott (Rockwell Intern Corp)

Mar 1977

**MSC-19473** Vol 1, No 4, p 639

Mechanical support structure originally designed for use with electrical cables can support hydraulic pneumatic and cryogenic lines where bends are required assemblies are inaccessible and conduits are impractical Support is also light in weight and offers means of damping vibration



## 08 FABRICATION TECHNOLOGY

**B76-10586**

### **ELASTROSTATIC-DISCHARGE DAMAGE TO SEMICONDUCTORS**

E R Freeman Jr (Martin Marietta Corp) and J R Beall (Martin Marietta Corp)

Mar 1977

**LANGLEY-11739**

**Vol 1, No 4, p 640**

Failure mechanisms test techniques and quality control procedures for difficult-to-detect class of failures have been devised. Test circuit provides electrostatic discharge similar to those encountered in production situation and assists in evaluation of susceptibility of specific circuits and devices.

**B76-10587**

### **TRANSDUCER BONDING KIT**

R M Roush, Jr (Rockwell Intern Corp) D A Lott (Rockwell Intern Corp) and A R Keir (Rockwell Intern Corp)

Mar 1977

**MSC-19690**

**Vol 1, No 4, p 641**

Inexpensive kit improves bond quality, saves time and is used in hard-to-reach areas. Kit provides precise pressure loading and allows pressure to be monitored during curing cycle.

**B76-10588**

### **EXPLOSIVE-SEAM WELDING SEALS LARGE PRESSURE VESSELS**

L J Bement

Mar 1977. See also B72-10002, B73-10180

**LANGLEY-12132**

**Vol 1, No 4, p 642**

Simple single-step operation hermetically seals aluminum, brass, steel, copper, and titanium vessels.

**B76-10589**

### **VACUUM HOLDDOWN FIXTURE**

P P Zebus (Rockwell Intern Corp) and P N Packer (Rockwell Intern Corp)

Mar 1977

**MSC-19686**

**Vol 1, No 4, p 643**

Variable-contour jig supports concave or convex objects.

**B76-10590**

### **VISUAL PROJECTION RETICLE**

R F Haines

Mar 1977

**ARC-10976**

**Vol 1, No 4, p 644**

Small lightweight device visually superimposes visual-sensitivity and response contours on displays and instrument panels. Optical system provides 45 deg arc/diameter field of view; however, special wide-angle optics can be substituted without significant size or weight penalty.

**B76-10591**

### **ANTIREFLECTION COATING FOR PLASTIC LENSES**

T J Wydeven and R M Kubacki (Bell and Howell Co)

Mar 1977

**ARC-10983**

**Vol 1, No 4, p 645**

Low-temperature plasma polymerized coating improves light transmission through plastic lenses.

**B76-10592**

### **MIXING INGREDIENTS IN FOAM DISPENSER**

W G Simpson

Mar 1977

**M-FS-20607**

**Vol 1, No 4, p 646**

Mixing insert built into nozzle blends fluids so that nozzle sprays homogeneous mixture. Simple construction of dispenser makes cleanup easy.

**B76-10593**

### **ALUMINUM TRANSFER METHOD FOR PLATING PLASTICS**

W D Goodrich and C J Stalmach Jr (LTV Aerospace Corp)

Mar 1977. See also B76-10556, NASA-CR-144364 (75-29356)

**MSC-16221**

**Vol 1, No 4, p 646**

Electroless plating technique produces plate of uniform thickness. Hardness and abrasion resistance can be increased

further by heat treatment. Method results in seamless coating over many materials, has low thermal conductivity, and is relatively inexpensive compared to conventional methods.

**B76-10594**

### **ELIMINATION OF THERMALLY GENERATED EMF'S ON PC BOARDS**

R G Holden (Singer Co) and M T Smid (Singer Co)

Mar 1977

**MSC-16125**

**Vol 1, No 4, p 647**

Dissimilar-metal contacts are placed on temperature-controlled substrate.

**B76-10595**

### **PREFABRICATED STRAIN-GAGE CONNECTORS**

A W Baker (Rockwell Intern Corp)

Mar 1977

**MSC-19522**

**Vol 1, No 4, p 648**

Terminals incorporating copper loops reduce on-site installation time for instrumentation.

**B76-10596**

### **FABRICATION OF ULTRA-LOW-NOISE AMPLIFIER**

E Kraemer (Cutler-Hammer Inc) and J Leeper (Cutler-Hammer, Inc)

Mar 1977

**GSFC-12186**

**Vol 1, No 4, p 648**

Three construction techniques reduce noise temperature of microwave parametric amplifier. Techniques include electroformed idler cavity, screw-tuned idler, and low-loss matching section.

## 09 MATHEMATICS AND INFORMATION SCIENCES

**B76-10133**

### **ESTIMATION OF SPARES**

M A Mezzacappa (Rockwell Intern Corp)

Mar 1976

**MSC-19469**

**Vol 1, No 1, p 135**

Simplified technique to determine the number of spare parts required for a given risk level employs short-cut approximations in lieu of computer-assisted or complex computational analyses.

**B76-10134**

### **LINEAR STOCHASTIC OPTIMAL CONTROL AND ESTIMATION**

L C Geyser and F K B Lehtinen

Mar 1976

**LEWIS-12505**

**Vol 1, No 1, p 135**

Digital program has been written to solve the LSOCE problem by using a time-domain formulation. LSOCE problem is defined as that of designing controls for linear time-invariant system which is disturbed by white noise in such a way as to minimize quadratic performance index.

**B76-10135**

### **GUIDE FOR TESTING NUMERICAL-INTEGRATION SUBROUTINES**

F T Krogh

Mar 1976

**NPO-11644**

**Vol 1, No 1, p 136**

Numerical technique has been developed for testing algorithms used to solve differential equations.

**B76-10136**

### **BUSINESS CAPABILITIES FILE**

W H Anderson and D A Costanza (Informatics, Inc)

Mar 1976

**NPO-13834**

**Vol 1, No 1, p 136**

Automated search system identifies businesses by their functional capabilities and geographic location. File is easy to maintain and update.

**B76-10285****RELATIVE HUMIDITY FROM PSYCHROMETRIC DATA**

T W Putnam

Aug 1976

**FRC-10108**

Vol 1, No 2, p 295

Analytical equation for computing relative humidity as function of wet bulb temperature, dry bulb temperature and atmospheric pressure is suitable for use with calculator or computer. Analytical expressions may be useful for chemical process control systems and building environmental control systems

**B76-10286****BIT-ERROR RATES IN OPTICAL COMMUNICATIONS**

W E Webb (Alabama Univ)

Aug 1976

**M-FS-23340**

Vol 1, No 2, p 296

Statistical model, which consists of on/off binary system assumes Poisson detection process and log-normal atmospheric scintillation. Based upon detection process and atmospheric ionization, piecewise linear model for adaptive threshold system is developed

**B76-10287****LEARNING/COST-IMPROVEMENT CURVES**

L M Delonback

Aug 1976

**M-FS-23429**

Vol 1, No 2, p 296

Review guide is an aid to manager or engineer who must determine production costs for components, systems or services. Methods are described by which manufacturers may use historical data, task characteristics and current cost data to estimate unit prices as function of number of units to be produced

**B76-10288****MULTIVARIATE NORMAL INTEGRATION**

L W Falls and M C Carter (Appalachian State Univ)

Aug 1976

**M-FS-22867**

Vol 1, No 2, p 297

Monte Carlo program evaluates integrals over rectangular regions for dimensions less than six and over elliptical regions in bivariate case. Program gives positive definite symmetric variance/covariance matrix factorization and calculates reciprocal of lower triangular matrix and product of diagonal elements of triangular matrix

**B76-10289****DORCA II DYNAMIC OPERATIONS REQUIREMENTS AND COST ANALYSIS PROGRAM**

Innovator not given (Aerospace Corp) Aug 1976

**HQN-10834**

Vol 1, No 2, p 297

Program is written to handle logistics of acquisition and transport of personnel, equipment and services and to determine costs, transport schedules, acquisition schedules, and fuel requirements of cargo transport

**B76-10434****CURVILINEAR BICUBIC-SPLINE-FIT INTERPOLATION**

C H Chi (Perkin-Elmer Corp)

Jan 1977

**LANGLEY-11391**

Vol 1, No 3, p 467

Modified technique is suited to circular systems represented by polar grid patterns

**B76-10435****INTERLEAVED CYCLIC CODES**

R W Hockenberger (IBM)

Jan 1977

**KSC-11040**

Vol 1, No 3, p 468

Analytical approach for development burst error correction and detection cyclic codes does not require shortening techniques

**B76-10436****CONTOURING RANDOMLY SPACED DATA**

J F Kibler, W D Morris, and R W Hamm (Computer Sci Corp)

Jan 1977

**LANGLEY-12044**

Vol 1, No 3, p 469

Computer program using triangulation contouring technique contours data points too numerous to fit into rectangular grid. Using random access procedures, program can handle up to 56,000 data points and provides up to 20 contour intervals for multiple number of parameters

**B76-10437****META-ASSEMBLER**

B C Hodges (McDonnell-Douglas Corp) and A J Edwards

Jan 1977

**M-FS-23449**

Vol 1, No 3, p 469

Machine-independent cross-assembler program can produce object modules for variety of computers. Program is capable of being reconfigured by data set supplied at assembly time

**B76-10438****PROCESSING EQUATIONS FOR STATE-SPACE MODELS**

R C Seidel

Jan 1977

**LEWIS-12555**

Vol 1, No 3, p 469

Three computer programs comprising six subroutines are used to calculate matrix stability and frequency response

**B76-10597****DOCUMENT RESTORATION BY COMPUTER TECHNIQUES**

L Mogavero, W Spuck (Caltech), and I M Levitt (Office of the Mayor Philadelphia Pa)

Mar 1977

**HQN-10910**

Vol 1, No 4, p 651

Technique utilizes automated electronic data-processing machine to successfully recover illegible information from faded or age distorted documents. Once recovered information can be displayed on cathode-ray-tube screen or reproduced in any desired size

**B76-10598****SAFETY ORGANIZATIONS AND EXPERTS**

G Mandel, R I Rubinstein (Franklin Inst), J J Pinto (Franklin Inst), and S Z Meschkow (Franklin Inst)

Mar 1977. See also B74-10019, NASA-CR-121206 (N74-10887), NASA-CR-134929 (N76-25153)

**LEWIS-12742**

Vol 1, No 4, p 652

Handbook lists organizations and experts in specific, well defined areas of safety technology. Special emphasis is given to relevant safety information sources on aircraft fire hazards and aircraft interior flammability

**B76-10599****LIBRARY INFORMATION RETRIEVAL SYSTEM**

I Y Chan

Mar 1977

**NPO-14017**

Vol 1, No 4, p 653

Program provides information retrieval by one or more of following data elements: subject, title, authors/editors, source, contract number and report number

**B76-10600****CAMSP CLASSIFICATION AND MENSURATION SOFTWARE PACKAGE**

Innovator not given (IBM Federal Systems Div) Mar 1977

**MSC-14979**

Vol 1, No 4, p 653

Batch/interactive system can be used to analyze any remotely sensed Earth resources data. Configuration requirements are 300K bytes of main storage, 200K bytes of storage for IMS, 600K bytes of storage for LCS, five 2314 disk drives, seven 9-track tape drives, and one cluster of digital television equipment

**B76-10601****OBLIQUE ORTHOGRAPHIC PROJECTIONS AND CONTOUR PLOTS**

G L Giles

Mar 1977

**LANGLEY-11877**

Vol 1, No 4, p 654

Oblique orthographic projections allow model to be viewed in any selected orientation specified by Euler-angle transformation. This transformation resolves coordinate system of model to principal plane on which display is to be plotted

## 09 MATHEMATICS AND INFORMATION SCIENCES

**B76-10602**

### **DATA-MANAGEMENT AND INFORMATION SYSTEM**

J J Long J N Hatfield M R Diethelm, and G Masters  
Mar 1977

**NPO-13716**

**Vol 1, No 4, p 654**

User command language consists of unabbreviated English words. System allows user to create, delete, sort, merge, update, punch or transfer all or portion of any file in system without programmer assistance.

**B76-10603**

### **CODE-USAGE ANALYSIS SYSTEM**

M A Goodwin (Lockheed Electronics Co) and P H Horsley (Lockheed Electronics Co)

Mar 1977

**MSC-16214**

**Vol 1, No 4, p 655**

Set of computer programs helps in interpretation of execution characteristics of application programs and applies software technology to questions concerning software performance and quality.

**B76-10604**

### **FORTRAN CODE-EVALUATION SYSTEM**

J D Capps and R Kleir

Mar 1977

**M-FS-23539**

**Vol 1, No 4, p 655**

Automated code evaluation system can be used to detect coding errors and unsound coding practices in any ANSI FORTRAN IV source code before they can cause execution-time malfunctions. System concentrates on acceptable FORTRAN code features which are likely to produce undesirable results.

**B76-10605**

### **TRANSFER-FUNCTION PARAMETERS**

R C Seidel

Mar 1977

**LEWIS-12612**

**Vol 1, No 4, p 656**

Computer program fits linear-factored form transfer function to given frequency-response data. Program is based on conjugate-gradient search procedure that minimizes error between given frequency-response data and frequency response of transfer function that is supplied by user.

**B76-10606**

### **INFORMATION RETRIEVAL AND DISPLAY SYSTEM**

J L Groover (Computer Sci Corp) and W L King (Computer Sci Corp)

Mar 1977

**M-FS-23510**

**Vol 1, No 4, p 657**

Versatile command-driven data management system offers users through simplified command language a means of storing and searching data files, sorting data files into specified orders, performing simple or complex computations, effecting file updates, and printing or displaying output data. Commands are simple to use and flexible enough to meet most data management requirements.

**B76-10607**

### **LINEAR STOCHASTIC OPTIMAL CONTROL AND ESTIMATION**

L C Geyser and F K B Lehtinen

Mar 1977

**LEWIS-12540, LEWIS-12505**

**Vol 1, No 4, p 657**

Problem is defined as that of designing controls for linear time invariant system which is disturbed by white noise, in such a way as to minimize quadratic performance index.

**B76-10608**

### **INTEGRAL-MATRIX PROCEDURE FOR BOUNDARY-LAYER PROBLEMS**

K W Gross and R M Evans (Acurex Corp)

Mar 1977

**M-FS-23348**

**Vol 1, No 4, p 657**

Program BLIMP provides fast, highly accurate solution to general class of gas-phase boundary layer flow problems encompassing broad range of boundary conditions. Program is

capable of obtaining accurate and economical solutions to governing differential equations of momentum, energy, and species.

**B76-10609**

### **SYSTEMS IMPROVED NUMERICAL DIFFERENCING ANALYZER**

L C Fink (TRW Inc)

Mar 1977 See also B72-10721 B72-10736

**MSC-13805**

**Vol 1, No 4, p 658**

Analyzer is software system that possesses capabilities which make it well suited for solving lumped-parameter representations of physical problems governed by diffusion-type equations, such as Fourier, Poisson, or Laplace.

**B76-10610**

### **INPUT/OUTPUT ERROR ANALYZER**

E T Vaughan

Mar 1977

**GSFC-12132**

**Vol 1, No 4, p 659**

Program aids in equipment assessment. Independent assembly-language utility program is designed to operate under level 27 or 31 of EXEC 8 Operating System. It scans user-selected portions of system log file, whether located on tape or mass storage, and searches for and processes 1/O error (type 6) entries.

## SUBJECT INDEX

## Subject Index

The title of each Tech Brief is listed under several selected subject headings to provide the user with a variety of approaches in his search for specific information. The Tech Brief number e.g. B76-10511, is located under and to the right of the title and is followed by a two-digit number e.g. 03, which designates the subject category in which the entire entry can be found.

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Analysis of laser heterodyne communications  
GSFC-12098 B76-10511 03

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Fail-safe hydraulic shaker protection  
NPO-13726 B76-10218 06

## ABRASION RESISTANCE

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ARC-10915 B76-10201 04

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MSC-14756 B76-10119 07

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LEWIS-12614 B76-10047 03

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MSC-14964 B76-10236 06  
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MSC-16010 B76-10191 04

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ARC-10898 B76-10367 05

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NPO-13726 B76-10218 06

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MSC-19217 B76-10203 04

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LEWIS-12544 B76-10320 02  
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M-FS-23428 B76-10253 07

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LEWIS-12686 B76-10226 06  
Noise suppressor for turbofan-jet engines  
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LEWIS-12686 B76-10226 06  
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## ACOUSTIC IMPEDANCE

Impedance of curved ducts  
LEWIS-12636 B76-10237 06

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LANGLEY-12016 B76-10216 06  
Measuring trace dispersants in gas streams  
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LANGLEY-11659 B76-10550 06

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ARC-10639 B76-10381 06

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MSC-15985 B76-10069 04

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NPO-13640 B76-10340 03  
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NPO-13759 B76-10494 03

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MSC-19480 B76-10146 01

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GSFC-10246 B76-10536 05

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MSC-19560 B76-10428 08

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MSC-19690 B76-10587 08

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M-FS-23287 B76-10015 01  
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NPO-13764 B76-10211 05  
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GSFC-11941 B76-10125 08

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MSC-12648 B76-10281 08

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Conical diffuser for fuel cells

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NPO-13474 B76-10060 04

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M-FS-23357 B76-10063 04

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Differential-optoacoustic absorption detector

NPO-13759 B76-10494 03

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ARC-10941 B76-10573 07

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Low-cost pressure-data encoder

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Low-cost dual-frequency microwave antenna

MSC-16100 B76-10462 01

Multifrequency broadband dual-polarized antenna

NPO-13866 B76-10464 01

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LANGLEY-12053 B76-10411 07

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MSC-16022 B76-10361 04

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LANGLEY-12121 B76-10566 06

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ARC-10808 B76-10168 02

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ARC-10911 B76-10379 06

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ARC-10903 B76-10477 02

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LANGLEY-11783 B76-10397 06

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MSC-16018 B76-10391 06

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NPO-13827 B76-10519 04

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MSC-15817 B76-10245 07

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LANGLEY-11843 B76-10058 04

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M-FS-23362 B76-10172 03

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Determining eutectic composition in metal alloys

LEWIS-12633 B76-10520 04

Stress-corrosion cracking due to hydrazine

ARC-11093 B76-10526 04

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MSC-19323 B76-10127 08

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MSC-19322 B76-10265 08

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MSC-19693 B76-10579 08

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NPO-13847 B76-10514 04

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ARC-11064 B76-10515 04

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NPO-13256 B76-10307 01

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NPO-13416 B76-10459 01

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LANGLEY-11988 B76-10551 06

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Modular design of high frequency circuits

M-FS-23408 B76-10139 01

# **ANALOG DATA**

Modular design of high frequency circuits  
M-FS-23408 B76-10139 01

# **ANALOG TO DIGITAL CONVERTERS**

A/D converter  
LANGLEY-11319 B76-10009 01  
Control logic for successive-approximation A/D converters  
NPO-11937 B76-10010 01  
Data-storage compression scheme  
NPO-13488 B76-10017 02  
Serial-to-parallel color-TV converter  
MSC-14844 B76-10027 02  
Subcarrier signal combiner for arrayed antennas  
NPO-13723 B76-10329 02  
Capacitive shaft-angle encoder  
ARC-10897 B76-10386 06  
Analog-to-digital conversion for radix (-2)  
NPO-13093 B76-10465 01

# **ANALYSIS (MATHEMATICS)**

Analytic numerical solutions for shock waves  
ARC-10959 B76-10096 06  
Transient thermal analysis of fluid systems  
MSC-19502 B76-10401 06  
Systems improved numerical differencing analyzer  
MSC-13805 B76-10609 09

# **ANALYTIC GEOMETRY**

Math model of 3-D aircraft configuration  
LANGLEY-12029 B76-10400 06

# **ANALYTICAL CHEMISTRY**

Hydrogen chloride test set  
M-FS-23357 B76-10063 04  
Miniature carbon dioxide sensor  
MSC-16009 B76-10344 03

# **ANALYZING**

Miniature carbon dioxide sensor  
MSC-16009 B76-10344 03

# **ANCHOIC CHAMBERS**

Acoustic testing of materials  
LANGLEY-11659 B76-10550 06

# **ANEMOMETERS**

Velocity sensor for slow flows  
LANGLEY-11785 B76-10380 06

# **ANGLES (GEOMETRY)**

Radial level  
LANGLEY-11982 B76-10246 07

# **ANGULAR MOMENTUM**

Miniature-angular-position transducer  
LANGLEY-11999 B76-10555 06

# **ANGULAR RESOLUTION**

Radial level  
LANGLEY-11982 B76-10246 07

Miniature-angular-position transducer  
LANGLEY-11999 B76-10555 06

# **ANGULAR VELOCITY**

Miniature-angular-position transducer  
LANGLEY-11999 B76-10555 06

# **ANHYDRIDES**

Polymeric foams stable at high temperatures  
ARC-11008 B76-10065 04

# **ANISOTROPIC SHELLS**

General instability analysis  
M-FS-23407 B76-10563 06

# **ANISOTROPY**

Triple-layer bubble-domain film  
LANGLEY-11755 B76-10006 01

# **ANNEALING**

Annealing strained alloy 718  
M-FS-19242 B76-10284 08

# **ANOLYTES**

REDOX electrochemical energy storage  
LEWIS-12220 B76-10070 04

# **ANTENNA ARRAYS**

Active retrodirective antenna  
NPO-13641 B76-10463 01

# **ANTENNA COUPLERS**

Diplexer switch  
LANGLEY-11546 B76-10448 01

# **ANTENNA DESIGN**

Low-cost dual-frequency microwave antenna  
MSC-16100 B76-10462 01  
Active retrodirective antenna  
NPO-13641 B76-10463 01  
Multifrequency broadband dual-polarized antenna  
NPO-13866 B76-10464 01  
Dielectric covered antennas  
MSC-16186 B76-10471 01

# **ANTENNA RADIATION PATTERNS**

Dielectric covered antennas  
MSC-16186 B76-10471 01

# **ANTIREFLECTION COATINGS**

Antireflection coating for plastic lenses  
ARC-10983 B76-10591 08

# **APPLICATIONS OF MATHEMATICS**

Predicting off-design performance of radial-inflow turbines  
LEWIS-12500 B76-10242 06  
Relative humidity from psychrometric data  
FRC-10108 B76-10285 09  
Multivariate normal integration  
M-FS-22867 B76-10288 09

# **APPLICATIONS PROGRAMS (COMPUTERS)**

CONVERT Technique and computer program for calculating photographic film-density variations  
LANGLEY-11873 B76-10057 03  
Proton tissue dose  
LANGLEY-11802 B76-10078 05  
NASTRAN component-mode synthesis  
MSC-19632 B76-10104 06  
MINIVER Miniature version of real/ideal gas aero-heating and ablation computer program  
M-FS-21951 B76-10105 06  
ESOP Version IV Energy systems optimization program  
MSC-14854 B76-10106 06  
Tangent-ogive nose cones  
GSFC-11468 B76-10107 06  
DYNGEN  
LEWIS-12506 B76-10108 06  
Venting for condensation in gas lines  
MSC-19621 B76-10109 06  
REJECT  
LEWIS-12375 B76-10110 06  
BUCLAP2  
LANGLEY-11696 B76-10111 06  
Swept-tapered-wing aerodynamics  
LANGLEY-11701 B76-10112 06  
SESOP Program for solar-energy heating-systems analysis  
MSC-14853 B76-10113 06  
Linear stochastic optimal control and estimation  
LEWIS-12505 B76-10134 09  
Business capabilities file  
NPO-13834 B76-10136 09

# **ARC DISCHARGES**

Sustained-arc ignition system  
LEWIS-12444 B76-10410 07

# **ATMOSPHERIC TURBULENCE**

# **ARC WELDING**

Polishing gold and gold-alloy crystals  
M-FS-22800 B76-10263 08  
Synchronized backside-weld follower  
M-FS-24454 B76-10272 08

# **ARCHITECTURE**

NASA technology utilization house  
LANGLEY-12134 B76-10570 07

# **ARITHMETIC AND LOGIC UNITS**

Signal enhancement filters  
MSC-14907 B76-10453 01

# **AROMATIC COMPOUNDS**

Polymeric foams stable at high temperatures  
ARC-11008 B76-10065 04

# **ARRAYS**

Combined GaAs laser outputs  
M-FS-23397 B76-10173 03  
Improved resolution for sensor arrays  
NPO-13745 B76-10439 01

# **ARTIFICIAL SATELLITES**

Pointing control/roll positioning mechanism  
M-FS-22809 B76-10121 07

# **ASSAYING**

Quantitative bioluminescent detection of bacteria  
GSFC-12003 B76-10073 05  
Laser particulate spectrometer  
MSC-14969 B76-10331 03  
Economical measurement of particle concentration  
GSFC-12088 B76-10332 03  
Determination of trace amounts of POF3  
LEWIS-10577 B76-10356 04

# **ASSEMBLER ROUTINES**

Meta-assembler  
M-FS-23449 B76-10437 09

# **ASSEMBLING**

Ablative-filled honeycomb composites  
LANGLEY-11180 B76-10273 08

# **ATMOSPHERIC ATTENUATION**

Differential-optoacoustic absorption detector  
NPO-13759 B76-10494 03

# **ATMOSPHERIC CHEMISTRY**

Hydrogen chloride test set  
M-FS-23357 B76-10063 04

# **ATMOSPHERIC COMPOSITION**

Differential-optoacoustic absorption detector  
NPO-13759 B76-10494 03

# **ATMOSPHERIC DENSITY**

Atmospheric particle sampler  
NPO-13396 B76-10059 04

# **ATMOSPHERIC ENTRY**

Shock-tube driver  
NPO-13528 B76-10090 06

# **ATMOSPHERIC MOISTURE**

Relative humidity from psychrometric data  
FRC-10108 B76-10285 09  
Quartz-crystal-oscillator hygrometer  
GSFC-12153 B76-10349 03

# **ATMOSPHERIC SCATTERING**

CONVERT Technique and computer program for calculating photographic film-density variations  
LANGLEY-11873 B76-10057 03  
Bit-error rates in optical communications  
M-FS-23340 B76-10286 09

# **ATMOSPHERIC TURBULENCE**

Laser-Doppler measurement of air turbulence  
M-FS-23155 B76-10031 03

## ATMOSPHERICS

Simplified deflection-coil linearity testing  
 M-FS-23400 876-10180 03  
 Bit-error rates in optical communications  
 M-FS-23340 876-10286 09

## ATTENUATORS

Band-elimination filter  
 M-FS-23303 876-10295 01

## ATTITUDE CONTROL

Spin-rate control device  
 ARC-10884 876-10417 07

## AUDIO EQUIPMENT

Nondestructive interior examination of moving parts  
 M-FS-23378 876-10545 06

## AUDITORY SIGNALS

Inexpensive low-voltage solid-state alarm  
 LEWIS-12544 876-10320 02  
 Oral annunciator with programmable vocabulary  
 MSC-14798 876-10326 02

## AUSTENITIC STAINLESS STEELS

Braze/Rebraze process for CRES steel  
 MSC-19600 876-10280 08

## AUTOMATIC CONTROL

Tracking system for moving subjects  
 HQN-10880 876-10028 02  
 Crosswind landing-gear position indicator  
 LANGLEY-11941 876-10120 07  
 Pointing control/roll positioning mechanism  
 M-FS-22809 876-10121 07

## AUTOMATIC CONTROL VALVES

Constant-rate fluid-delivery system  
 MSC-14905 876-10214 06

## AUTOMATIC TEST EQUIPMENT

Overhead tray for cable test system  
 MSC-19488 876-10270 08

## AUTOMATION

Miniature carbon dioxide sensor  
 MSC-16009 876-10344 03

## AUTOMOBILE ENGINES

Improved automobile gas turbine engine  
 LEWIS-12521 876-10115 07

## AUTORADIOGRAPHY

Image intensification of developed photographs  
 M-FS-23461 876-10495 03

## AUXILIARY POWER SOURCES

Hybrid-mode thermionic converter  
 HQN-10876 876-10056 03

## AXIAL LOADS

Analysis of axisymmetric shell structure  
 LANGLEY-12059 876-10398 06

## B

## BACKGROUND NOISE

Receiver performance evaluator  
 NPO-13701 876-10324 02

## BACTERIA

Quantitative bioluminescent detection of bacteria  
 GSFC-12003 876-10073 05  
 Signal processing and display for electrochemical data  
 LANGLEY-11922 876-10327 02  
 Remote water-monitoring system  
 LANGLEY-11973 876-10365 05

## BACTERIOLOGY

Quantitative bioluminescent detection of bacteria  
 GSFC-12003 876-10073 05  
 Fast measurement of bacterial susceptibility to antibiotics  
 GSFC-10246 876-10536 05

## BALL BEARINGS

Fluid-film bearing damper  
 LEWIS-11158 876-10378 06

## BALLISTIC TRAJECTORIES

Impact of a solid body with water  
 M-FS-23512 876-10560 06

## BALLS

Improved cryogenic shaft seals  
 M-FS-19153 876-10080 06  
 Long-life ball-valve design  
 M-FS-19282 876-10576 07

## BANDPASS FILTERS

Band-elimination filter  
 M-FS-23303 876-10295 01  
 Pinhole diffraction filter  
 GSFC-12120 876-10333 03  
 Charge-sensitive amplifier with notched frequency response  
 LANGLEY-11317 876-10440 01

## BANDS

Controlled linear clasper/loader  
 GSFC-12105 876-10432 08

## BARRIER LAYERS

Flexible-pile thermal sealant  
 MSC-19568 876-10371 06

## BATCH PROCESSING

Meta-assembler  
 M-FS-23449 876-10437 09  
 CAMSP Classification and Mensuration Software Package  
 MSC-14979 876-10600 09

## BATTERY CHARGERS

Compact reconditioner for Ni/Cd cells  
 M-FS-23270 876-10141 01

## BAYES THEOREM

GEODYN Orbital and geodetic parameter estimation  
 GSFC-12014 876-10396 06

## BCH CODES

Interleaved cyclic codes  
 KSC-11040 876-10435 09

## BEAM SPLITTERS

Improved interferometer beam splitter  
 NPO-11932 876-10041 03  
 Beam splitter/combiner  
 GSFC-12083 876-10177 03  
 Monitor for optical-window contamination  
 ARC-10947 876-10345 03

## BEAMS (RADIATION)

Beam splitter/combiner  
 GSFC-12083 876-10177 03

## BEARINGS

Fluid-film bearing damper  
 LEWIS-11158 876-10378 06

## BELLOWES

Constant-rate fluid-delivery system  
 MSC-14905 876-10214 06  
 Low-pressure-gas sampling pump  
 ARC-10941 876-10573 07

## BENDING

Relative stiffness of flat-conductor cable  
 M-FS-23537 876-10469 01

## BENZENE

Novel aminobenzyl and imidobenzyl benzenes  
 LANGLEY-11843 876-10058 04

## BERYLLIUM ALLOYS

Elimination of thermally generated EMF's on PC boards  
 MSC-16125 876-10594 08

## BIAS

Optical bias assembly  
 MSC-14412 876-10051 03

## BIMETALS

Zero-angle helical coil  
 GSFC-10969 876-10085 06

## BINARY CODES

Manchester transition tracking loop (MTTL)  
 MSC-14842 876-10319 02

## BINARY DATA

PN ranging/telemetry transmission  
 GSFC-12017 876-10323 02

## BINARY MIXTURES

Determining eutectic composition in metal alloys  
 LEWIS-12633 876-10520 04

## BINARY TO DECIMAL CONVERTERS

Binary/BCD-to-ASCII data converter  
 GSFC-12044 876-10322 02

## BIOACOUSTICS

Biomedical ultrasonoscope  
 ARC-10994 876-10537 05

## BIOCHEMISTRY

Fraction collector for electrophoresis  
 M-FS-23459 876-10352 04

## BIODYNAMICS

Accelerator for biomedical studies  
 ARC-10898 876-10367 05

## BIOENGINEERING

Occlusive-cuff controller  
 MSC-14836 876-10207 05  
 Rocking-motion sensor for the blind  
 MSC-14805 876-10366 05

## BIOINSTRUMENTATION

Myocardial wall-thickness transducer  
 NPO-13644 876-10075 05  
 Occlusive-cuff controller  
 MSC-14836 876-10207 05  
 Hybrid thin-film amplifier  
 MSC-13975 876-10314 01  
 Short-range biotelemetry system  
 MSC-16011 876-10369 05

## BIOLUMINESCENCE

Quantitative bioluminescent detection of bacteria  
 GSFC-12003 876-10073 05

## BIOMEDICAL DATA

Proton tissue dose  
 LANGLEY-11802 876-10078 05  
 Occlusive-cuff controller  
 MSC-14836 876-10207 05

## BIOMETRICS

Fraction collector for electrophoresis  
 M-FS-23459 876-10352 04  
 Automated EEG acquisition  
 MSC-16111 876-10364 05  
 Accelerator for biomedical studies  
 ARC-10898 876-10367 05  
 Biomedical ultrasonoscope  
 ARC-10994 876-10537 05

## BIOPAKS

Aseptic fluid-transfer system  
 NPO-13743 876-10210 05

## BIOPHYSICS

Occlusive-cuff controller  
 MSC-14836 876-10207 05

## BIOTELEMETRY

Occlusive-cuff controller  
 MSC-14836 876-10207 05  
 Automated EEG acquisition  
 MSC-16111 876-10364 05

- In vivo bone-strain telemetry  
ARC-11074 B76-10535 05
- BIREFRINGENCE**  
Two-wavelength dye laser  
LANGLEY-12012 B76-10170 03
- BISMUTH COMPOUNDS**  
Nucleation of electronic-crystal regions  
B76-10524 04
- BISTABLE CIRCUITS**  
Control logic for  
successive-approximation A/D converters  
NPO-11937 B76-10010 01
- BIT SYNCHRONIZATION**  
Long binary frame sync words  
NPO-13727 B76-10163 02  
Manchester transition tracking loop  
(MTTL)  
MSC-14842 B76-10319 02
- BIVARIATE ANALYSIS**  
Multivariate normal integration  
M-FS-22867 B76-10288 09
- BLADES (CUTTERS)**  
Hot-wire tile removal tool  
KSC-11043 B76-10433 08
- BLINDNESS**  
Rocking-motion sensor for the blind  
MSC-14805 B76-10366 05
- BLOOD**  
Aseptic fluid-transfer system  
NPO-13743 B76-10210 05
- BLOOD CIRCULATION**  
Occlusive-cuff controller  
MSC-14836 B76-10207 05
- BLOOD VESSELS**  
Occlusive-cuff controller  
MSC-14836 B76-10207 05
- BODY FLUIDS**  
Aseptic fluid-transfer system  
NPO-13743 B76-10210 05  
Fast measurement of bacterial  
susceptibility to antibiotics  
GSFC-10246 B76-10536 05
- BODY MEASUREMENT (BIOLOGY)**  
Occlusive-cuff controller  
MSC-14836 B76-10207 05
- BOILING**  
Liquid-retention canopy  
M-FS-24133 B76-10092 06
- BOLTS**  
ROUS bolt-tensioning monitor  
LANGLEY-12016 B76-10216 06  
Large-diameter fasteners of CRES alloy  
MSC-19313 B76-10250 07  
High-torque open-end wrench  
NPO-13541 B76-10405 07  
Slotted bolts and studs for vacuum  
systems  
LEWIS-10391 B76-10407 07  
Soft seat A-N fitting for vacuum use  
LEWIS-10130 B76-10408 07  
Dynamic load attenuator  
MSC-17472 B76-10416 07
- BONDING**  
Organic adhesives for hybrid  
microcircuits  
M-FS-23370 B76-10014 01  
Reliability of hybrid microcircuit  
bonding  
M-FS-23358 B76-10129 08  
Transistor-to-substrate bond quality  
M-FS-21931 B76-10137 01  
Solar cell electrical connections  
LEWIS-12293 B76-10260 08  
3-D foam adhesive deposition  
M-FS-22739 B76-10271 08  
Improved bonding of honeycomb panels  
MSC-19560 B76-10428 08
- Transducer bonding kit  
MSC-19690 B76-10587 08
- BONES**  
Graphite-reinforced bone cement  
NPO-13764 B76-10211 05  
In vivo bone-strain telemetry  
ARC-11074 B76-10535 05
- BOROSILICATE GLASS**  
Borosilicate glass-to-Kovar tube  
bonding  
GSFC-12077 B76-10278 08  
Fuel-cell powerplant insulation  
MSC-16012 B76-10426 08
- BOTTLES**  
Cleaning large tanks and gas bottles  
MSC-14966 B76-10430 09
- BOUNDARY LAYER FLOW**  
Outer flow and turbulence in boundary  
layers  
M-FS-23286 B76-10100 06  
Hot-wire probe  
ARC-10900 B76-10222 06  
Swept wing aerodynamics  
ARC-10790 B76-10403 06
- BOUNDARY LUBRICATION**  
Fundamentals of fluid sealing  
LEWIS-12683 B76-10392 06
- BOUNDARY VALUE PROBLEMS**  
COMOC a finite-element algorithm for  
the Navier-Stokes equations  
LANGLEY-11480 B76-10241 06
- BOW WAVES**  
Shock interference patterns and heating  
LANGLEY-11497 B76-10240 06
- BRAGG ANGLE**  
Shadow mask for X-ray spectrometer  
GSFC-12131 B76-10348 03
- BRAKES (FOR ARRESTING MOTION)**  
Safety brake for tape reels  
GSFC-11960 B76-10412 07
- BRANCHING (MATHEMATICS)**  
Active retrodirective antenna  
NPO-13641 B76-10463 01
- BRAZING**  
Combined joining process for dissimilar  
metals A concept  
MSC-19323 B76-10127 08  
Tool removes brazed fittings  
LANGLEY-10944 B76-10244 07  
Diffusion brazing nickel-plated stainless  
steel  
MSC-19322 B76-10265 08  
Repair of fused silica platens  
MSC-19713 B76-10276 08  
Technique for joining metal tubing  
ARC-10946 B76-10279 08  
Brazing/Rebrazing process for CRES steel  
MSC-19600 B76-10280 08  
Precision centering vise  
KSC-11041 B76-10409 07
- BREADBOARD MODELS**  
Modular design of high frequency  
circuits  
M-FS-23408 B76-10139 01
- BREATHING APPARATUS**  
Firefighter's breathing system  
MSC-14733 B76-10208 05  
Miniature emergency oxygen unit  
KSC-11011 B76-10539 05
- BRIDGMAN METHOD**  
Growing crystals from eutectic melts  
M-FS-22926 B76-10202 04
- BRIGHTNESS**  
Fluorescent dimming ballast  
MSC-14937 B76-10292 01  
Solid-state turn-coordinator display  
LANGLEY-12090 B76-10451 01
- BRIGHTNESS DISCRIMINATION**  
Analog-to-binary conversion of video  
data  
GSFC-11918 B76-10165 02
- BROADBAND AMPLIFIERS**  
Charge-sensitive amplifier with notched  
frequency response  
LANGLEY-11317 B76-10440 01
- BUBBLE TECHNIQUE**  
Triple-layer bubble-domain film  
LANGLEY-11755 B76-10006 01  
A passive chevron replicator  
LANGLEY-11906 B76-10441 01  
New passive replicator for bubble domain  
devices  
LANGLEY-11997 B76-10442 01  
Continuous-data FIFO bubble shift  
register  
LANGLEY-11862 B76-10443 01  
Multiple-bubble detector  
LANGLEY-12043 B76-10444 01
- BUCKLING**  
BUCLAP2  
LANGLEY-11696 B76-10111 06  
Analysis of axisymmetric shell structure  
LANGLEY-12059 B76-10398 06  
SPAR Structural-performance analysis  
and redesign  
LANGLEY-12062 B76-10399 06  
Energy-absorbing attenuator  
MSC-17473 B76-10419 07
- BUFFER STORAGE**  
Fraction-storage unit for  
drug-identification system  
NPO-13111 B76-10200 04
- BUILDINGS**  
NECAP NASA Energy-cost analysis  
program  
LANGLEY-11888 B76-10239 06
- BUNDLES**  
Electrical-cable design guide  
M-FS-24280 B76-10157 01
- BUNKERS (FUEL)**  
Cryogenic storage tank thermal analysis  
MSC-19103 B76-10234 06
- BURGER EQUATION**  
Analytic numerical solutions for shock  
waves  
ARC-10959 B76-10096 06
- BURNS (INJURIES)**  
Multispectral imaging for medical  
diagnosis  
NPO-13922 B76-10540 05
- BUS CONDUCTORS**  
Connector contact-ring bus  
MSC-19480 B76-10146 01
- BUTT JOINTS**  
Compound solder joints  
LANGLEY-11444 B76-10274 08

## C

- C BAND**  
Low-cost dual-frequency microwave  
antenna  
MSC-16100 B76-10462 01
- CABLES (ROPES)**  
Cable-load equalization system  
MSC-17494 B76-10230 06
- CALIBRATING**  
Pulse amplitude discriminator threshold  
calibration  
GSFC-11912 B76-10023 02



- Calibration source for sensitive optical detectors  
 LANGLEY-11625 B76-10036 03  
 Calibration of image dissector tubes  
 M-FS-22208 B76-10055 03  
 Cyclical bidirectional rotary actuator  
 GSFC-11883 B76-10117 07  
 Self-calibrating radiometer  
 ARC-10811 B76-10339 03  
 Terrestrial photovoltaic measurements workshop  
 LEWIS-12643 B76-10350 03
- CALORIC REQUIREMENTS**  
 Meal system for the elderly  
 MSC-16062 B76-10530 05
- CAMERA SHUTTERS**  
 DC drive system for cine/pulse cameras  
 MSC-16085 B76-10497 03
- CAMERA TUBES**  
 Magnifying image intensifier  
 GSFC-12010 B76-10506 03
- CAMERAS**  
 Optics and lasers  
 HQN-10893 B76-10187 03  
 Optical devices  
 HQN-10891 B76-10188 03  
 DC drive system for cine/pulse cameras  
 MSC-16085 B76-10497 03
- CANCER**  
 Liquid-cooled bra for cancer detection  
 ARC-11007 B76-10533 05
- CANOPIES**  
 Liquid-retention canopy  
 M-FS-24133 B76-10092 06
- CANTILEVER MEMBERS**  
 Exercise support for therapy  
 LANGLEY-11975 B76-10074 05
- CAPACITANCE SWITCHES**  
 Capacitive shaft-angle encoder  
 ARC-10897 B76-10386 06
- CAPACITORS**  
 Improved wet-slug capacitor  
 LANGLEY-11720 B76-10008 01  
 Reliability of hybrid microcircuit bonding  
 M-FS-23358 B76-10129 08  
 All-tantalum electrolytic capacitor  
 M-FS-23462 B76-10424 08
- CARBON**  
 Less-costly activated carbon for sewage treatment  
 NPO-13877 B76-10516 04
- CARBON COMPOUNDS**  
 Cost saving synergistic shaft seal  
 LEWIS-12119 B76-10081 06  
 Coating for solar panels  
 M-FS-23420 B76-10196 04
- CARBON DIOXIDE**  
 Miniature carbon dioxide sensor  
 MSC-16009 B76-10344 03
- CARBON DIOXIDE CONCENTRATION**  
 Determining total carbon in hydrazine  
 KSC-11022 B76-10521 04
- CARBON FIBER REINFORCED PLASTICS**  
 Graphite-reinforced bone cement  
 NPO-13764 B76-10211 05
- CARBON STEELS**  
 Cleaning carbon steel  
 KSC-10689 B76-10275 08
- CARDIOGRAMS**  
 Biomedical ultrasonoscope  
 ARC-10994 B76-10537 05
- CARRIAGES**  
 Rigid cable support for blind installations  
 MSC-19473 B76-10585 08
- CARRIER WAVES**  
 Subcarrier signal combiner for arrayed antennas  
 NPO-13723 B76-10329 02
- CAST ALLOYS**  
 Determining eutectic composition in metal alloys  
 LEWIS-12633 B76-10520 04
- CATALYSTS**  
 Catalysts for low-energy aldehyde processes  
 NPO-13827 B76-10519 04
- CATALYTIC ACTIVITY**  
 Catalytic oxidation of waste materials  
 MSC-14831 B76-10354 04
- CATHODES**  
 Ultra-high-vacuum electrical feedthrough  
 HQN-10799 B76-10005 01
- CATHOLYTES**  
 REDOX - electrochemical energy storage  
 LEWIS-12220 B76-10070 04
- CAVITATION FLOW**  
 Cavitating performance of pumping machinery  
 LEWIS-12423 B76-10394 06
- CAVITY RESONATORS**  
 Fabrication of ultra-low-noise amplifier  
 GSFC-12186 B76-10596 08
- CELESTIAL GEODESY**  
 Geodetic control net  
 NPO-13718 B76-10510 03
- CEMENTS**  
 Graphite-reinforced bone cement  
 NPO-13764 B76-10211 05
- CENTRAL ELECTRONIC MANAGEMENT SYSTEM**  
 Data-management and information system  
 NPO-13716 B76-10602 09
- CENTRAL PROCESSING UNITS**  
 Reduction of computer power interruptions  
 MSC-16136 B76-10479 02
- CENTRIFUGES**  
 Fluid classifier and disseminator  
 HQN-10748 B76-10089 06  
 Integral fan/water separator  
 MSC-14756 B76-10119 07
- CERAMICS**  
 Improved high-temperature heater with stabilized-zirconia elements  
 M-FS-23351 B76-10221 06  
 Enamel for high-temperature superalloys  
 M-FS-22804 B76-10358 04  
 Fabrication and applications of electrets  
 M-FS-23437 B76-10429 08
- CERMETS**  
 Measuring mandibular motions  
 ARC-10956 B76-10362 05
- CHANNELS (DATA TRANSMISSION)**  
 Microprogramed telemetry processor  
 ARC-11061 B76-10460 01  
 Advanced imaging communication system  
 NPO-13545 B76-10482 02
- CHARGE COUPLED DEVICES**  
 Improved resolution for sensor arrays  
 NPO-13745 B76-10439 01
- Electrostatic analysis of charge-coupled structures  
 M-FS-23507 B76-10472 01
- CHARGE TRANSFER DEVICES**  
 Electrostatic analysis of charge-coupled structures  
 M-FS-23507 B76-10472 01
- CHARGED PARTICLES**  
 Spatial filter for Q-switched laser  
 LEWIS-12164 B76-10501 03
- CHASSIS**  
 Improved shelf for electronic modules  
 NPO-13158 B76-10578 07
- CHEMICAL ANALYSIS**  
 Quantitative bioluminescent detection of bacteria  
 GSFC-12003 B76-10073 05  
 Fluid classifier and disseminator  
 HQN-10748 B76-10089 06  
 Chemiluminescent prediction of service life  
 MSC-16010 B76-10191 04  
 Automated solvent concentrator  
 NPO-13068 B76-10198 04  
 Precolumn for extract concentration  
 NPO-13083 B76-10199 04  
 Fraction-storage unit for drug-identification system  
 NPO-13111 B76-10200 04  
 Borosilicate glass-to-Kovar tube bonding  
 GSFC-12077 B76-10278 08  
 A forward-scatter polarimeter for chemical analysis  
 NPO-13756 B76-10334 03  
 Fast measurement of bacterial susceptibility to antibiotics  
 GSFC-10246 B76-10536 05
- CHEMICAL ATTACK**  
 Vapor corrosion inhibitors  
 M-FS-19232 B76-10206 04
- CHEMICAL CLEANING**  
 Cleaning carbon steel  
 KSC-10689 B76-10275 08
- CHEMICAL EQUILIBRIUM**  
 Multispecies transient simulator  
 MSC-14862 B76-10527 04
- CHEMICAL REACTORS**  
 Electrolyte cells measure oxygen fugacities  
 MSC-16089 B76-10523 04
- CHEMICAL TESTS**  
 Hydrogen chloride test set  
 M-FS-23357 B76-10063 04
- CHEMILUMINESCENCE**  
 Chemiluminescent prediction of service life  
 MSC-16010 B76-10191 04
- CHIPS**  
 Transistor-to-substrate bond quality  
 M-FS-21931 B76-10137 01
- CHLOROPRENE RESINS**  
 Nomograph for castor-cushion design  
 MSC-17094 B76-10229 06
- CHROMATOGRAPHY**  
 Inexpensive portable drug detector  
 ARC-10633 B76-10534 05
- CINEMATOGRAPHY**  
 DC drive system for cine/pulse cameras  
 MSC-16085 B76-10497 03
- CIRCUIT BOARDS**  
 Multiple-layer printed-wiring trace connector  
 LANGLEY-11709 B76-10305 01  
 Mask analysis program  
 M-FS-23431 B76-10318 01

- Elimination of thermally generated EMF's on PC boards  
MSC-16125 B76-10594 08
- CIRCUIT PROTECTION**  
Compact reconditioner for Ni/Cd cells  
M-FS-23270 B76-10141 01  
A nonsaturating dc-to-dc parallel power converter  
GSFC-12047 B76-10290 01  
Foldback current-limiting for hybrid regulator  
M-FS-22995 B76-10301 01  
Battery single-cell protection system  
LEWIS-12039 B76-10306 01  
Overload-protector/fault-indicator circuit  
NPO-13592 B76-10308 01  
Plug-in circuit monitor  
MSC-19455 B76-10311 01  
WING Calculating lightning-induced voltages in electrical circuits within an aircraft wing  
LEWIS-12108 B76-10351 03  
Capacitively-coupled data receiver clipper stage  
MSC-14989 B76-10456 01  
Active inrush-current limiter  
GSFC-11789 B76-10467 01
- CIRCUIT RELIABILITY**  
A nonsaturating dc-to-dc parallel power converter  
GSFC-12047 B76-10290 01
- CIRCUITS**  
Modular design of high frequency circuits  
M-FS-23408 B76-10139 01  
Surface mounted flat-conductor cable  
M-FS-223135 B76-10152 01  
Electronic circuits  
HQN-10894 B76-10156 01  
A linear phase demodulator  
GSFC-12018 B76-10291 01  
Deflection amplifier for image dissectors  
NPO-13079 B76-10449 01  
Low-power programmable high-voltage supply  
LANGLEY-11316 B76-10458 01
- CIRCULAR POLARIZATION**  
Low-cost dual-frequency microwave antenna  
MSC-16100 B76-10462 01
- CLAMPING CIRCUITS**  
CMOS-compatible tristate cable driver  
M-FS-23410 B76-10149 01  
Low-frequency sine wave hard-limiting technique  
NPO-13230 B76-10309 01
- CLAMPS**  
Precision centering vise  
KSC-11041 B76-10409 07  
Rigid cable support for blind installations  
MSC-19473 B76-10585 08  
Transducer bonding kit  
MSC-19690 B76-10587 08  
Vacuum holddown fixture  
MSC-19666 B76-10589 08
- CLASSICAL MECHANICS**  
Impact response analyses  
M-FS-23335 B76-10559 06
- CLASSIFIERS**  
Fluid classifier and disseminator  
HQN-10748 B76-10089 06
- CLEANING**  
Cleaning large tanks and gas bottles  
MSC-14966 B76-10430 09
- CLEAR AIR TURBULENCE**  
Airport laser-Doppler  
M-FS-23423 B76-10174 03
- CLEARANCES**  
Paddle-pin alignment test  
KSC-10740 B76-10388 06
- CLIMATOLOGY**  
Relative humidity from psychrometric data  
FRC-10108 B76-10285 09
- CLIPPER CIRCUITS**  
Capacitively-coupled data receiver clipper stage  
MSC-14989 B76-10456 01
- CLIPS**  
Controlled linear clamber/loader  
GSFC-12105 B76-10432 08
- COAGULATION**  
Standard aerosols for particle velocimeters  
M-FS-23075 B76-10050 03
- COAL**  
Less-costly activated carbon for sewage treatment  
NPO-13877 B76-10516 04
- COAL LIQUEFACTION**  
Surfactant-assisted coal liquefaction  
NPO-13904 B76-10517 04
- COATING**  
Low-reflectivity spectrally selective coating  
GSFC-12114 B76-10184 03
- COATINGS**  
Solar selective surfaces  
LEWIS-12614 B76-10047 03  
Comparative thermal fatigue resistance  
LEWIS-12563 B76-10062 04  
Transparent and flame-retardant potting compounds  
MSC-14669 B76-10066 04  
Coatings for mullite insulation  
LANGLEY-11150 B76-10067 04  
Passive thermal-control coatings  
M-FS-22794 B76-10071 04  
Coating for solar panels  
M-FS-23420 B76-10196 04  
Parylene coating for circuit components  
M-FS-23450 B76-10583 08
- COAXIAL CABLES**  
Waveguide-to-coax transition/low-pass filter  
NPO-13642 B76-10147 01  
Rigid cable support for blind installations  
MSC-19473 B76-10585 08
- COBALT ALLOYS**  
Comparative thermal fatigue resistance  
LEWIS-12563 B76-10062 04
- CODERS**  
Control logic for successive-approximation A/D converters  
NPO-11937 B76-10010 01  
M-ary shift register  
NPO-11868 B76-10011 01  
Capacitive shaft-angle encoder  
ARC-10897 B76-10386 06  
Serial-data correlator/code translator  
KSC-11025 B76-10454 01
- CODING**  
Long binary frame sync words  
NPO-13727 B76-10163 02  
Concatenated algebraic decoder  
MSC-14058 B76-10325 02  
Microprogramming for real-time data acquisition  
KSC-11027 B76-10328 02
- Serial-data correlator/code translator  
KSC-11025 B76-10454 01  
Analog-to-digital conversion for radix (-2)  
NPO-13093 B76-10465 01  
All-digital sequence correlator  
NPO-13737 B76-10468 01  
Advanced imaging communication system  
NPO-13545 B76-10482 02  
Code-usage analysis system  
MSC-16214 B76-10603 09  
FORTRAN code-evaluation system  
M-FS-23539 B76-10604 09
- COERCIVITY**  
Analog data recording on MnBi film  
NPO-13302 B76-10175 03
- COHERENT RADIATION**  
Spatially-coherent coupled semiconductor lasers  
M-FS-23396 B76-10500 03
- COHERENT SCATTERING**  
Dual-purpose holocamera  
LEWIS-12166 B76-10505 03
- COLD SURFACES**  
Electron-beam welder alignment  
MSC-19642 B76-10269 08
- COLD TRAPS**  
Separation of water from air samples  
ARC-10890 B76-10205 04
- COLD WORKING**  
Age-forming aluminum panels  
MSC-12648 B76-10281 08  
Forming hard aluminum in complex shapes  
MSC-19693 B76-10579 08
- COLLIMATORS**  
Improved collimator for imaging system  
M-FS-22863 B76-10038 03
- COLOR PHOTOGRAPHY**  
Frame for daylight photocopying  
KSC-11026 B76-10406 07
- COLOR TELEVISION**  
Unichromatic-carrier color-TV system  
MSC-14683 B76-10026 02  
Serial-to-parallel color-TV converter  
MSC-14844 B76-10027 02  
Color to black-and-white converter  
MSC-12618 B76-10346 03
- COLORIMETRY**  
Unichromatic-carrier color-TV system  
MSC-14683 B76-10026 02
- COLUMNS (PROCESS ENGINEERING)**  
Separation of water from air samples  
ARC-10890 B76-10205 04
- COMBUSTION CONTROL**  
Sustained-arc ignition system  
LEWIS-12444 B76-10410 07
- COMBUSTION EFFICIENCY**  
Sustained-arc ignition system  
LEWIS-12444 B76-10410 07
- COMMERCIAL AIRCRAFT**  
Experimental data for new fire-retardant materials  
MSC-16022 B76-10361 04
- COMMUNICATION**  
Electronic circuits  
HQN-10894 B76-10156 01  
Demodulator aids synchronization  
NPO-13605 B76-10164 02  
A linear phase demodulator  
GSFC-12018 B76-10291 01
- COMMUNICATION CABLES**  
CMOS-compatible tristate cable driver  
M-FS-23410 B76-10149 01  
Electrical-cable design guide  
M-FS-24280 B76-10157 01

**COMMUNICATION EQUIPMENT**

- Remote access of modem by digital control  
 GSFC-11943 B76-10022 02  
 Solid-state RF switch  
 NPO-13081 B76-10315 01  
 Diplexer switch  
 LANGLEY-11546 B76-10448 01
- COMMUNICATION THEORY**  
 Long binary frame sync words  
 NPO-13727 B76-10163 02  
 Demodulator aids synchronization  
 NPO-13605 B76-10164 02  
 Interleaved cyclic codes  
 KSC-11040 B76-10435 09
- COMPARATORS**  
 Analog-to-binary conversion of video data  
 GSFC-11918 B76-10165 02
- COMPENSATORS**  
 Optimal insensitive-controller synthesis  
 M-FS-21666 B76-10103 06
- COMPENSATORY TRACKING**  
 Horizontally-mounted solar collector  
 M-FS-23349 B76-10256 07
- COMPILERS**  
 Meta-assembler  
 M-FS-23449 B76-10437 09
- COMPONENT RELIABILITY**  
 NASTRAN component-mode synthesis  
 MSC-19632 B76-10104 06  
 Reliability of hybrid microcircuit bonding  
 M-FS-23358 B76-10129 08  
 Elastostatic-discharge damage to semiconductors  
 LANGLEY-11739 B76-10586 08
- COMPOSITE MATERIALS**  
 Lightweight orthotic appliances  
 LANGLEY-11918 B76-10076 05  
 Metalworking method for composites  
 M-FS-23354 B76-10132 08  
 Graphite-reinforced bone cement  
 NPO-13764 B76-10211 05  
 Ultra-lightweight pressure vessels  
 MSC-14983 B76-10266 08  
 Toroidal converter core  
 NPO-13413 B76-10293 01  
 Composite laminate warpage  
 LEWIS-12615 B76-10355 04  
 Second-generation PMR polyimides  
 LEWIS-12738 B76-10359 04  
 Astronautic structures manual  
 M-FS-23547 B76-10393 06  
 Low-pressure low-temperature molding process  
 MSC-19778 B76-10425 08  
 Mechanical loader for testing composites  
 LEWIS-12432 B76-10548 06
- COMPOSITE STRUCTURES**  
 Ablative-filled honeycomb composites  
 LANGLEY-11180 B76-10273 08  
 Composite stacked moly-permalloy cores  
 NPO-13578 B76-10294 01  
 Improved bonding of honeycomb panels  
 MSC-19560 B76-10428 08
- COMPRESSED AIR**  
 Compressed air cylinder pallet  
 MSC-19217 B76-10203 04  
 Firefighter's breathing system  
 MSC-14733 B76-10208 05
- COMPRESSED GAS**  
 Compressed air cylinder pallet  
 MSC-19217 B76-10203 04

- Gas boost compressor  
 MSC-14757 B76-10415 07
- COMPRESSIBILITY EFFECTS**  
 Liquid-retention canopy  
 M-FS-24133 B76-10092 06
- COMPRESSORS**  
 Improved automobile gas turbine engine  
 LEWIS-12521 B76-10115 07  
 Gas boost compressor  
 MSC-14757 B76-10415 07
- COMPUTER COMPONENTS**  
 Electrostatic analysis of charge-coupled structures  
 M-FS-23507 B76-10472 01  
 Reduction of computer power interruptions  
 MSC-16136 B76-10479 02
- COMPUTER GRAPHICS**  
 Graphic-to-digital conversion system  
 M-FS-24410 B76-10019 02
- COMPUTER PROGRAMMING**  
 FORTRAN code-evaluation system  
 M-FS-23539 B76-10604 09
- COMPUTER PROGRAMS**  
 SANDTRACKS World map and stations predictions computer programs  
 GSFC-12099 B76-10190 03  
 DORCA II Dynamic operations requirements and cost analysis program  
 HQN-10834 B76-10289 09  
 Impact response analyses  
 M-FS-23335 B76-10559 06
- COMPUTER STORAGE DEVICES**  
 M-ary shift register  
 NPO-11868 B76-10011 01
- COMPUTER SYSTEMS DESIGN**  
 Prevention of design flaws in multicomputer systems  
 MSC-14920 B76-10330 02  
 Reduction of computer power interruptions  
 MSC-16136 B76-10479 02
- COMPUTER SYSTEMS PROGRAMS**  
 Microprogramming for real-time data acquisition  
 KSC-11027 B76-10328 02  
 Meta-assembler  
 M-FS-23449 B76-10437 09  
 Code-usage analysis system  
 MSC-16214 B76-10603 09
- COMPUTERIZED DESIGN**  
 Economical custom LSI arrays  
 M-FS-23262 B76-10004 01
- COMPUTERIZED SIMULATION**  
 Birth/death process model  
 NPO-13616 B76-10213 05  
 NECAP NASA Energy-cost analysis program  
 LANGLEY-11888 B76-10239 06
- CONCENTRATORS**  
 Fluid classifier and disseminator  
 HQN-10748 B76-10089 06  
 Automated solvent concentrator  
 NPO-13068 B76-10198 04  
 Precolumn for extract concentration  
 NPO-13083 B76-10199 04  
 Fraction-storage unit for drug-identification system  
 NPO-13111 B76-10200 04  
 Improved solar-energy collector  
 NPO-13813 B76-10486 03
- CONCENTRIC CYLINDERS**  
 Concentric-tube differential drive  
 M-FS-22707 B76-10114 07

**CONDENSATION**

- Venting for condensation in gas lines  
 MSC-19621 B76-10109 06
- CONDENSERS**  
 Integral fan/water separator  
 MSC-14756 B76-10119 07
- CONDUCTIVE HEAT TRANSFER**  
 Vacuum-jacketed line spacer  
 MSC-14365 B76-10083 06  
 Thermal-diode heat pipe  
 ARC-10997 B76-10223 06  
 Thermal network modeling handbook  
 MSC-14964 B76-10236 06
- CONDUCTIVITY**  
 Thermal network modeling handbook  
 MSC-14964 B76-10236 06
- CONNECTORS**  
 Connector contact-ring bus  
 MSC-19480 B76-10146 01  
 Manufacture of flat-conductor cable  
 M-FS-23121 B76-10155 01  
 Electrical-cable design guide  
 M-FS-24280 B76-10157 01  
 Multiple-layer printed-wiring trace connector  
 LANGLEY-11709 B76-10305 01
- CONFERENCES**  
 Terrestrial photovoltaic measurements workshop  
 LEWIS-12643 B76-10350 03
- CONICAL FLOW**  
 Conical diffuser for fuel cells  
 MSC-14026 B76-10255 07
- CONNECTORS**  
 Connector contact-ring bus  
 MSC-19480 B76-10146 01  
 Soft seat A-N fitting for vacuum use  
 LEWIS-10130 B76-10408 07
- CONSOLES**  
 Graphic-to-digital conversion system  
 M-FS-24410 B76-10019 02
- CONSTANTAN**  
 One-wire thermocouple  
 MSC-16220 B76-10556 06  
 Aluminum transfer method for plating plastics  
 MSC-16221 B76-10593 08
- CONSTRUCTION**  
 NASA technology utilization house  
 LANGLEY-12134 B76-10570 07
- CONTACT RESISTANCE**  
 Semiconductor ohmic contact  
 LANGLEY-11691 B76-10461 01
- CONTAINERLESS MELTS**  
 Acoustic-energy shaping of meltable metals  
 NPO-13802 B76-10423 08
- CONTAINERS**  
 Ultra-lightweight pressure vessels  
 MSC-14983 B76-10266 08
- CONTAINMENT**  
 Liquid-retention canopy  
 M-FS-24133 B76-10092 06
- CONTAMINANTS**  
 Introducing controlled matter into a fluid system  
 M-FS-24309 B76-10093 06  
 Laser particulate spectrometer  
 MSC-14969 B76-10331 03  
 Purity test for copper-plating solutions  
 M-FS-19298 B76-10360 04  
 Detecting contamination on a metal surface  
 M-FS-19260 B76-10552 06

# CONTAMINATION

- Increased safety in mercury-containing devices  
M-FS-23308 876-10013 01
- Vacuum-ultraviolet reflectometer  
MSC-14995 876-10336 03
- Monitor for optical-window contamination  
ARC-10947 876-10345 03
- Contamination monitoring of fluids  
KSC-11037 876-10382 06

# CONTINUOUS SPECTRA

- Shadow mask for X-ray spectrometer  
GSFC-12131 876-10348 03

# CONTINUOUS WAVE LASERS

- Low-threshold light-emitting-diode laser  
LANGLEY-11477 876-10176 03

# CONTINUUM MECHANICS

- COMOC a finite-element algorithm for the Navier-Stokes equations  
LANGLEY-11480 876-10241 06

# CONTOURS

- Visual projection reticle  
ARC-10976 876-10590 08
- Oblique orthographic projections and contour plots  
LANGLEY-11877 876-10601 09

# CONTROL

- Fail-safe hydraulic shaker protection  
NPO-13726 876-10218 06

# CONTROL EQUIPMENT

- Dispensing a measured quantity of a liquid  
M-FS-21163 876-10574 07

# CONTROL STABILITY

- Determining aircraft stability and control derivatives  
FRC-10109 876-10402 06

# CONTROL VALVES

- Dispensing a measured quantity of a liquid  
M-FS-21163 876-10574 07
- Long-life ball-valve design  
M-FS-19282 876-10576 07

# CONTROLLABILITY

- Omnidirectional wheel  
M-FS-21309 876-10575 07

# CONTROLLERS

- Optimal insensitive-controller synthesis  
M-FS-21666 876-10103 06
- Power-control switch  
M-FS-23395 876-10148 01

# CONVECTION

- Thermal network modeling handbook  
MSC-14964 876-10236 06

# CONVECTIVE FLOW

- Heat pipe technology  
HQN-10901 876-10233 06
- Multidimensional heat conduction  
MSC-16159 876-10509 03

# CONVECTIVE HEAT TRANSFER

- MINIVER Miniature version of real/ideal gas aero-heating and ablation computer program  
M-FS-21951 876-10105 06
- Cavitating performance of pumping machinery  
LEWIS-12423 876-10394 06
- Heat-transfer coefficients of pin-finned cylinders  
LEWIS-12557 876-10554 06
- Aluminum transfer method for plating plastics  
MSC-16221 876-10593 08

# CONVERTERS

- Serial-to-parallel color-TV converter  
MSC-14844 876-10027 02

# COOLANTS

- Noncontaminating method for visualizing gas flow  
LEWIS-12076 876-10088 06

# COOLING SYSTEMS

- Sublimator/evaporator heat sink  
ARC-10912 876-10384 06
- Liquid-cooled bra for cancer detection  
ARC-11007 876-10533 05
- Improved shelf for electronic modules  
NPO-13158 876-10578 07

# COORDINATE TRANSFORMATIONS

- Curvilinear bicubic-spline-fit interpolation  
LANGLEY-11391 876-10434 09

# COORDINATION

- Manual dexterity evaluator  
LANGLEY-12022 876-10209 05

# COPPER

- Purity test for copper-plating solutions  
M-FS-19298 876-10360 04

# CORE STORAGE

- Digital video image system  
M-FS-23322 876-10166 02

# CORRELATION

- Development ephemeris number 96  
NPO-14002 876-10507 03

# CORRELATION DETECTION

- Subcarrier signal combiner for arrayed antennas  
NPO-13723 876-10329 02

# CORRELATORS

- All-digital sequence correlator  
NPO-13737 876-10468 01

# CORROSION

- Handbook of liquid metals  
M-FS-23355 876-10072 04
- Vapor corrosion inhibitors  
M-FS-19232 876-10206 04

# CORROSION PREVENTION

- Cleaning carbon steel  
KSC-10689 876-10275 08

# CORROSION RESISTANCE

- Specific-ion electrodes for measuring Ag ions  
MSC-14906 876-10068 04

# CORRUGATED PLATES

- Metal structures with parallel pores  
GSFC-10984 876-10131 08

# COST ANALYSIS

- NECAP NASA Energy-cost analysis program  
LANGLEY-11888 876-10239 06
- Learning/cost-improvement curves  
M-FS-23429 876-10287 09
- DORCA II Dynamic operations requirements and cost analysis program  
HQN-10834 876-10289 09

# COST ESTIMATES

- Learning/cost-improvement curves  
M-FS-23429 876-10287 09

# COUNTERS

- M-ary shift register  
NPO-11868 876-10011 01

# COUNTING CIRCUITS

- Two-dimensional photon detector  
M-FS-23325 876-10048 03
- Counting digital filter  
NPO-11821 876-10296 01
- Circulating-lines digital filter  
NPO-11831 876-10297 01
- Partitioned counting digital filter  
NPO-11832 876-10298 01
- RAM digital filter  
NPO-13659 876-10316 01
- Recording-tape position sensor  
GSFC-12056 876-10577 07

# COUNTING RATE COMPUTERS

- Circulating-lines digital filter  
NPO-11831 876-10297 01
- Partitioned counting digital filter  
NPO-11832 876-10298 01
- Hybrid digital-analog implementation of digital filters  
NPO-11833 876-10299 01

# COUPLING

- High-torque open-end wrench  
NPO-13541 876-10405 07

# COUPLING CIRCUITS

- Superconductive neuristor R-junction  
HQN-10871 876-10003 01

# COUPLINGS

- Flexible fitting for fluid lines  
MSC-17780 876-10277 08
- Microprogramable module  
MSC-19456 876-10312 01
- Soft seat A-N fitting for vacuum use  
LEWIS-10130 876-10408 07

# COVARIANCE

- Multivariate normal integration  
M-FS-22867 876-10288 09

# CRACK PROPAGATION

- Crack-growth analysis  
M-FS-23320 876-10243 06

# CRACKING (FRACTURING)

- Crack-growth analysis  
M-FS-23320 876-10243 06
- Repair of fused silica platens  
MSC-19713 876-10276 08
- Ultrasonic measurement of fracture toughness  
LEWIS-12642 876-10372 06
- Stress-corrosion cracking due to hydrazine  
ARC-11093 876-10526 04

# CRANES

- Cable-load equalization system  
MSC-17494 876-10230 06

# CRITICAL LOADING

- Energy-absorbing attenuator  
MSC-17473 876-10419 07

# CROP GROWTH

- Remote sensing of vegetation and soil  
GSFC-11976 876-10490 03

# CROP IDENTIFICATION

- CAMSP Classification and Mensuration Software Package  
MSC-14979 876-10600 09

# CROSSLINKING

- Polymeric foams stable at high temperatures  
ARC-11008 876-10065 04

# CROSSTALK

- Biased-circuit digital data line receiver  
MSC-14967 876-10457 01

# CRYOGENIC EQUIPMENT

- Improved cryogenic shaft seals  
M-FS-19153 876-10080 06
- Vacuum-jacketed line spacer  
MSC-14365 876-10083 06

# CRYOGENIC FLUID STORAGE

- Liquid-retention canopy  
M-FS-24133 876-10092 06
- Vapor/liquid interface sensor  
MSC-12474 876-10220 06
- Cryogenic storage tank thermal analysis  
MSC-19103 876-10234 06
- External heater for cryogenic vessels  
MSC-14056 876-10337 03

# CRYOGENIC FLUIDS

- Vapor/liquid interface sensor  
MSC-12474 876-10220 06

Cavitating performance of pumping machinery  
LEWIS-12423 876-10394 06

**CRYOGENICS**  
Reducing cold flow in elastomeric O-rings  
M-FS-24336 876-10086 06

**CRYOTRAPPING**  
Separation of water from air samples  
ARC-10890 876-10205 04

**CRYSTAL DEFECTS**  
Soldering high-impedance Nichrome wire  
M-FS-1457 876-10264 08

**CRYSTAL GROWTH**  
Growing crystals from eutectic melts  
M-FS-22926 876-10202 04  
RF shaping of silicon ribbon  
M-FS-23424 876-10258 08  
Epitaxial growth of Ga<sub>1-x</sub>Al<sub>x</sub>As on GaP  
GSFC-11826 876-10261 08  
Semiconductor ohmic contact  
LANGLEY-11691 876-10461 01  
Nucleation of electronic-crystal regions  
M-FS-23049 876-10524 04

**CRYSTAL STRUCTURE**  
Nucleation of electronic-crystal regions  
876-10524 04  
Crystal orientation for solid-state photolithography  
LANGLEY-11940 876-10582 08

**CRYSTAL SURFACES**  
Soldering high-impedance Nichrome wire  
M-FS-1457 876-10264 08  
Fabrication and applications of electrets  
M-FS-23437 876-10429 08

**CRYSTALLOGRAPHY**  
High-resolution electron microscope  
NPO-13811 876-10499 03  
Nucleation of electronic-crystal regions  
M-FS-23049 876-10524 04

**CUBIC EQUATIONS**  
Math model of 3-D aircraft configuration  
LANGLEY-12029 876-10400 06

**CURIE TEMPERATURE**  
Analog data recording on MnBi film  
NPO-13302 876-10175 03

**CURING**  
New diamine hardeners for epoxies  
LANGLEY-11823 876-10522 04

**CURRENT AMPLIFIERS**  
Power-control switch  
M-FS-23395 876-10148 01

**CURRENT DENSITY**  
Resistance heating elements with specific heating profiles  
LEWIS-10719 876-10095 06

**CURRENT REGULATORS**  
Power-control switch  
M-FS-23395 876-10148 01  
Fluorescent dimming ballast  
MSC-14937 876-10292 01  
Foldback current-limiting for hybrid regulator  
M-FS-22995 876-10301 01  
Active inrush-current limiter  
GSFC-11789 876-10467 01

**CURVE FITTING**  
Math model of 3-D aircraft configuration  
LANGLEY-12029 876-10400 06  
Contouring randomly spaced data  
LANGLEY-12044 876-10436 09

**CURVED PANELS**

Age-forming aluminum panels  
MSC-12648 876-10281 08

**CUSHIONS**

Nomograph for castor-cushion design  
MSC-17094 876-10229 06  
Viscoelastic foam cushion  
ARC-11089 876-10525 04

**CUTTERS**

Rotary broaches  
M-FS-23374 876-10248 07

**CUTTING**

Rotary broaches  
M-FS-23374 876-10248 07

**CYCLIC LOADS**

Mechanical loader for testing composites  
LEWIS-12432 876-10548 06

**CYLINDRICAL BODIES**

Heat-transfer coefficients of pin-finned cylinders  
LEWIS-12557 876-10554 06

**CYLINDRICAL SHELLS**

General instability analysis  
M-FS-23407 876-10563 06

**CYLINDRICAL TANKS**

Compressed air cylinder pallet  
MSC-19217 876-10203 04

**CZOCHEWALSKI METHOD**

Nucleation of electronic-crystal regions  
M-FS-23049 876-10524 04

**D****DAMPING**

Low-onset-rate energy absorber  
MSC-12279 876-10385 06

**DARKROOMS**

Frame for daylight photocopying  
KSC-11026 876-10406 07

**DATA ACQUISITION**

Data-storage compression scheme  
NPO-13488 876-10017 02  
General-purpose data link  
M-FS-22714 876-10025 02  
SANDTRACKS World map and stations predictions computer programs  
GSFC-12099 876-10190 03  
Counting digital filter  
NPO-11821 876-10296 01  
Circulating-lines digital filter  
NPO-11831 876-10297 01  
Partitioned counting digital filter  
NPO-11832 876-10298 01  
RAM digital filter  
NPO-13659 876-10316 01  
Microprogramming for real-time data acquisition  
KSC-11027 876-10328 02  
Automated EEG acquisition  
MSC-16111 876-10364 05  
Flexible high-speed instrumentation system  
FRC-10110 876-10483 02  
Data system for multiplexed water-current meters  
M-FS-23343 876-10493 03  
Data-management and information system  
NPO-13716 876-10602 09

**DATA COLLECTION PLATFORMS**

Remote water-monitoring system  
LANGLEY-11973 876-10365 05

**DATA COMPRESSION**

Data-storage compression scheme  
NPO-13488 876-10017 02

**DATA CONVERSION ROUTINES**

Analog-to-digital conversion for radix (-2)  
NPO-13093 876-10465 01

**DATA CONVERTERS**

A/D converter  
LANGLEY-11319 876-10009 01  
Control logic for successive-approximation A/D converters  
NPO-11937 876-10010 01  
Serial-to-parallel color-TV converter  
MSC-14844 876-10027 02  
Analog-to-binary conversion of video data  
GSFC-11918 876-10165 02  
Analog-to-digital conversion for radix (-2)  
NPO-13093 876-10465 01  
Miniature-angular-position transducer  
LANGLEY-11999 876-10555 06

**DATA CORRELATION**

Long binary frame sync words  
NPO-13727 876-10163 02

**DATA LINKS**

General-purpose data link  
M-FS-22714 876-10025 02  
Microprogramed telemetry processor  
ARC-11061 876-10460 01

**DATA MANAGEMENT**

Data-management and information system  
NPO-13716 876-10602 09  
Information retrieval and display system  
M-FS-23510 876-10606 09

**DATA PROCESSING**

CMOS-compatible tristate cable driver  
M-FS-23410 876-10149 01  
Automatic fire/weather data station  
ARC-10993 876-10160 02  
Manchester transition tracking loop (MTTL)  
MSC-14842 876-10319 02  
Processing equations for state-space models  
LEWIS-12555 876-10438 09  
Doppler extraction with a digital VCO  
MSC-14814 876-10452 01  
Biased-circuit digital data line receiver  
MSC-14967 876-10457 01  
Microprogramed telemetry processor  
ARC-11061 876-10460 01  
All-digital sequence correlator  
NPO-13737 876-10468 01  
Instrumentation for measuring low-level currents/voltages  
MSC-14855 876-10480 02  
Transpose of finite-element data  
MSC-19644 876-10564 06  
Document restoration by computer techniques  
HQN-10910 876-10597 09  
Data-management and information system  
NPO-13716 876-10602 09  
Code-usage analysis system  
MSC-16214 876-10603 09  
Information retrieval and display system  
M-FS-23510 876-10606 09  
Input/output error analyzer  
GSFC-12132 876-10610 09

**DATA PROCESSING EQUIPMENT**

Biased-circuit digital data line receiver  
MSC-14967 876-10457 01

**DATA RECORDERS**

- Interactive imaging and data processing  
NPO-13655 876-10167 02
- Signal processing and display for  
electrochemical data  
LANGLEY-11922 876-10327 02
- Multiple-bubble detector  
LANGLEY-12043 876-10444 01

**DATA RECORDING**

- Fast pressure-sensor system  
LANGLEY-12003 876-10087 06
- Electronic circuits  
HQN-10894 876-10156 01
- Analog data recording on MnBi film  
NPO-13302 876-10175 03

**DATA REDUCTION**

- Contouring randomly spaced data  
LANGLEY-12044 876-10436 09
- Transpose of finite-element data  
MSC-19644 876-10564 06
- Oblique orthographic projections and  
contour plots  
LANGLEY-11877 876-10601 09
- Code-usage analysis system  
MSC-16214 876-10603 09
- Transfer-function parameters  
LEWIS-12612 876-10605 09
- Input/output error analyzer  
GSFC-12132 876-10610 09

**DATA RETRIEVAL**

- General-purpose data link  
M-FS-22714 876-10025 02
- Photorefractive page composer  
M-FS-23419 876-10171 03
- PN ranging/telemetry transmission  
GSFC-12017 876-10323 02

**DATA SAMPLING**

- General-purpose data link  
M-FS-22714 876-10025 02
- Partitioned counting digital filter  
NPO-11832 876-10298 01
- Hybrid digital-analog implementation of  
digital filters  
NPO-11833 876-10299 01
- Low-frequency sine wave hard-limiting  
technique  
NPO-13230 876-10309 01

**DATA SMOOTHING**

- Contouring randomly spaced data  
LANGLEY-12044 876-10436 09

**DATA STORAGE**

- M-ary shift register  
NPO-11868 876-10011 01
- Data-storage compression scheme  
NPO-13488 876-10017 02
- General-purpose data link  
M-FS-22714 876-10025 02
- Readout method for stored information  
NPO-13243 876-10029 02
- Voltage control for corona charging  
thermoplastics  
M-FS-23102 876-10043 03
- Permanent holographic storage medium  
M-FS-22588 876-10044 03
- Electrode structure for uniform corona  
discharge  
M-FS-22617 876-10045 03
- Photorefractive page composer  
M-FS-23419 876-10171 03
- Continuous-data FIFO bubble shift  
register  
LANGLEY-11862 876-10443 01
- Microprogramed telemetry processor  
ARC-11061 876-10460 01
- Data-management and information  
system  
NPO-13716 876-10602 09

**DATA SYSTEMS**

- Remote access of modem by digital  
control  
GSFC-11943 876-10022 02
- General-purpose data link  
M-FS-22714 876-10025 02
- Fast pressure-sensor system  
LANGLEY-12003 876-10087 06
- Interactive imaging and data processing  
NPO-13655 876-10167 02
- Flexible high-speed instrumentation  
system  
FRC-10110 876-10483 02

**DATA TRANSMISSION**

- Remote access of modem by digital  
control  
GSFC-11943 876-10022 02
- General-purpose data link  
M-FS-22714 876-10025 02
- Long binary frame sync words  
NPO-13727 876-10163 02
- Voltage-offset reduction in data  
transmitters  
MSC-14933 876-10321 02
- Binary/BCD-to-ASCII data converter  
GSFC-12044 876-10322 02
- Remote water-monitoring system  
LANGLEY-11973 876-10365 05
- Serial-data correlator/code translator  
KSC-11025 876-10454 01
- Microprogramed telemetry processor  
ARC-11061 876-10460 01
- Tracking a phase-shift-keyed signal  
MSC-16170 876-10481 02
- Advanced imaging communication  
system  
NPO-13545 876-10482 02

**DATUM (ELEVATION)**

- Leveling apparatus for precision  
instruments  
ARC-10981 876-10572 07

**DECAY**

- Thermoluminescence for forensic  
analysis  
NPO-11607 876-10192 04

**DECAY RATES**

- Fabrication and applications of electrets  
M-FS-23437 876-10429 08

**DECELERATION**

- Low-onset-rate energy absorber  
MSC-12279 876-10385 06

**DECIMAL TO BINARY CONVERTERS**

- Binary/BCD-to-ASCII data converter  
GSFC-12044 876-10322 02

**DECISION THEORY**

- Demodulator aids synchronization  
NPO-13605 876-10164 02

**DECONTAMINATION**

- Cleaning large tanks and gas bottles  
MSC-14966 876-10430 09

**DEEP SPACE INSTRUMENTATION FACILITY**

- Advanced imaging communication  
system  
NPO-13545 876-10482 02

**DEFECTS**

- Faster X-ray analysis of semiconductor  
wafers  
M-FS-23315 876-10225 06

**DEFORMATION**

- Diffusion brazing nickel-plated stainless  
steel  
MSC-19322 876-10265 08
- General instability analysis  
M-FS-23407 876-10563 06

**DEGRADATION**

- Chemiluminescent prediction of service  
life  
MSC-16010 876-10191 04

**DEGREES OF FREEDOM**

- NASTRAN component-mode synthesis  
MSC-19632 876-10104 06

**DEHUMIDIFICATION**

- Integral fan/water separator  
MSC-14756 876-10119 07
- Separation of water from air samples  
ARC-10890 876-10205 04

**DEHYDRATED FOOD**

- Meal system for the elderly  
MSC-16062 876-10530 05

**DEICERS**

- External heater for cryogenic vessels  
MSC-14056 876-10337 03

**DELTA MODULATION**

- Data-storage compression scheme  
NPO-13488 876-10017 02
- Serial-to-parallel color-TV converter  
MSC-14844 876-10027 02

**DEMULATION**

- Doppler extraction with a digital VCO  
MSC-14814 876-10452 01

**DEMULATORS**

- Demodulator aids synchronization  
NPO-13605 876-10164 02

**DENTISTRY**

- Measuring mandibular motions  
ARC-10956 876-10362 05

**DEPENDENT VARIABLES**

- Control system design  
LEWIS-12556 876-10404 06

**DEPOLARIZATION**

- A forward-scatter polarimeter for  
chemical analysis  
NPO-13756 876-10334 03

**DEPOSITION**

- 3-D foam adhesive deposition  
M-FS-22739 876-10271 08
- Molecular beam generator  
MSC-14996 876-10353 04

**DEPTH MEASUREMENT**

- Electro-optical liquid depth sensor  
M-FS-22921 876-10024 02

**DERMATOLOGY**

- Multispectral imaging for medical  
diagnosis  
NPO-13922 876-10540 05

**DESALINIZATION**

- Membrane has high urea-rejection  
properties  
ARC-10980 876-10518 04

**DESIGN ANALYSIS**

- Prevention of design flaws in  
multicomputer systems  
MSC-14920 876-10330 02

**DETECTION**

- Inexpensive tags for tubes or cables  
LEWIS-12676 876-10584 08

**DETERIORATION**

- Pump failure monitor  
M-FS-23366 876-10219 06

**DEW**

- Quartz-crystal-oscillator hygrometer  
GSFC-12153 876-10349 03

**DIAGNOSIS**

- Occlusive-cuff controller  
MSC-14836 876-10207 05
- Physician's modern 'Black Bag'  
MSC-14936 876-10212 05
- Disposable biomedical electrode  
MSC-14623 876-10363 05
- Caution and warning system  
MSC-16046 876-10531 05

- Multispectral imaging for medical diagnosis  
NPO-13922 B76-10540 05
- DIAMINES**  
New diamine hardeners for epoxies  
LANGLEY-11823 B76-10522 04
- DIAPHRAGMS**  
Fast pressure-sensor system  
LANGLEY-12003 B76-10087 06
- DIELECTRIC POLARIZATION**  
All-tantalum electrolytic capacitor  
M-FS-23462 B76-10424 08
- DIELECTRIC PROPERTIES**  
Improved wet-slug capacitor  
LANGLEY-11720 B76-10008 01
- DIELECTRICS**  
Fabrication and applications of electrets  
M-FS-23437 B76-10429 08
- DIES**  
Economical custom LSI arrays  
M-FS-23262 B76-10004 01
- DIETS**  
Meal system for the elderly  
MSC-16062 B76-10530 05
- DIFFERENTIAL AMPLIFIERS**  
Deflection amplifier for image dissectors  
NPO-13079 B76-10449 01
- DIFFERENTIAL EQUATIONS**  
DYNGEN  
LEWIS-12506 B76-10108 06  
Guide for testing numerical-integration subroutines  
NPO-11644 B76-10135 09  
Rapid kinetics  
LANGLEY-12140 B76-10529 04
- DIFFERENTIAL THERMAL ANALYSIS**  
Reliability of hybrid microcircuit bonding  
M-FS-23358 B76-10129 08
- DIFFRACTION**  
Field distribution in a thin lens  
LANGLEY-11392 B76-10179 03
- DIFFRACTION PATTERNS**  
Elimination of color rings on film negatives  
GSFC-12110 B76-10498 03
- DIFFUSERS**  
Conical diffuser for fuel cells  
MSC-14026 B76-10255 07
- DIFFUSION**  
Handbook of liquid metals  
M-FS-23355 B76-10072 04  
Systems improved numerical differencing analyzer  
MSC-13805 B76-10609 09
- DIFFUSION WELDING**  
Combined joining process for dissimilar metals A concept  
MSC-19323 B76-10127 08  
Diffusion brazing nickel-plated stainless steel  
MSC-19322 B76-10265 08
- DIGITAL DATA**  
A linear phase demodulator  
GSFC-12018 B76-10291 01  
Concatenated algebraic decoder  
MSC-14058 B76-10325 02  
All-digital sequence correlator  
NPO-13737 B76-10468 01
- DIGITAL FILTERS**  
Counting digital filter  
NPO-11821 B76-10296 01  
Circulating-lines digital filter  
NPO-11831 B76-10297 01  
Partitioned counting digital filter  
NPO-11832 B76-10298 01
- Hybrid digital-analog implementation of digital filters  
NPO-11833 B76-10299 01  
RAM digital filter  
NPO-13659 B76-10316 01  
Signal enhancement filters  
MSC-14907 B76-10453 01  
Document restoration by computer techniques  
HQN-10910 B76-10597 09
- DIGITAL INTEGRATORS**  
Simplified deflection-coil linearity testing  
M-FS-23400 B76-10180 03
- DIGITAL RADAR SYSTEMS**  
Signal enhancement filters  
MSC-14907 B76-10453 01
- DIGITAL SYSTEMS**  
Control logic for successive-approximation A/D converters  
NPO-11937 B76-10010 01  
M-ary shift register  
NPO-11868 B76-10011 01  
Sensor for analog speed controls  
LEWIS-12597 B76-10020 02  
Remote access of modem by digital control  
GSFC-11943 B76-10022 02  
Instrumentation for measuring low-level currents/voltages  
MSC-14855 B76-10480 02
- DIGITAL TECHNIQUES**  
Control logic for successive-approximation A/D converters  
NPO-11937 B76-10010 01  
M-ary shift register  
NPO-11868 B76-10011 01  
Sensor for analog speed controls  
LEWIS-12597 B76-10020 02  
Serial-data correlator/code translator  
KSC-11025 B76-10454 01  
All-digital sequence correlator  
NPO-13737 B76-10468 01  
Code-usage analysis system  
MSC-16214 B76-10603 09  
Input/output error analyzer  
GSFC-12132 B76-10610 09
- DIGITAL TO ANALOG CONVERTERS**  
Counting digital filter  
NPO-11821 B76-10296 01  
Circulating-lines digital filter  
NPO-11831 B76-10297 01  
Subcarrier signal combiner for arrayed antennas  
NPO-13723 B76-10329 02
- DIMENSIONAL MEASUREMENT**  
Electrical-conduit sizing gage  
MSC-19491 B76-10150 01  
Precision measurement of changes in physical dimensions  
M-FS-23527 B76-10543 06
- DIMENSIONAL STABILITY**  
Precision measurement of changes in physical dimensions  
M-FS-23527 B76-10543 06
- DIMMING**  
Fluorescent dimming ballast  
MSC-14937 B76-10292 01
- DIPLEXERS**  
Diplexer switch  
LANGLEY-11546 B76-10448 01
- DISCONTINUITY**  
Effects of mismatch on group delay of microwave transmission  
NPO-13863 B76-10478 02
- DISCRIMINATORS**  
Pulse amplitude discriminator threshold calibration  
GSFC-11912 B76-10023 02  
Analog-to-binary conversion of video data  
GSFC-11918 B76-10165 02
- DISPENSERS**  
Dispensing a measured quantity of a liquid  
M-FS-21163 B76-10574 07
- DISPLAY DEVICES**  
Calibration of image dissector tubes  
M-FS-22208 B76-10055 03  
Fast pressure-sensor system  
LANGLEY-12003 B76-10087 06  
Digital video image system  
M-FS-23322 B76-10166 02  
Interactive imaging and data processing  
NPO-13655 B76-10167 02  
Multiplane binocular visual display system  
ARC-10808 B76-10168 02  
Inexpensive low-voltage solid-state alarm  
LEWIS-12544 B76-10320 02  
Signal processing and display for electrochemical data  
LANGLEY-11922 B76-10327 02  
Solid-state turn-coordinator display  
LANGLEY-12090 B76-10451 01  
Video simulator with electronic ranging  
MSC-14965 B76-10474 02  
Full-color hybrid display  
ARC-10903 B76-10477 02  
Caution and warning system  
MSC-16046 B76-10531 05
- DISSOLVING**  
Cleaning large tanks and gas bottles  
MSC-14966 B76-10430 09
- DISTRIBUTED AMPLIFIERS**  
Wideband distribution amplifier  
NPO-13256 B76-10307 01
- DIVING (UNDERWATER)**  
Hand fin for swimming  
M-FS-21632 B76-10122 07
- DOCUMENT STORAGE**  
Information retrieval and display system  
M-FS-23510 B76-10606 09
- DOCUMENTATION**  
Vapor corrosion inhibitors  
M-FS-19232 B76-10206 04  
Annealing strained alloy 718  
M-FS-19242 B76-10284 08
- DOLLIES**  
Nomograph for castor-cushion design  
MSC-17094 B76-10229 06  
Mechanical positioner  
MSC-15817 B76-10245 07
- DOMAIN WALL**  
Analog data recording on MnBi film  
NPO-13302 B76-10175 03  
Multiple-bubble detector  
LANGLEY-12043 B76-10444 01
- DOORS**  
Load-regulating latch  
MSC-19535 B76-10252 07  
Door latch with through-access hole  
MSC-19634 B76-10414 07
- DOPPLER EFFECT**  
Laser-Doppler measurement of air turbulence  
M-FS-23155 B76-10031 03  
Doppler extraction with a digital VCO  
MSC-14814 B76-10452 01

**DOPPLER NAVIGATION**

- Standard aerosols for particle velocimeters  
M-FS-23075 B76-10050 03  
Wind velocity measurement  
M-FS-23362 B76-10172 03

**DOPPLER RADAR**

- Airport laser-Doppler  
M-FS-23423 B76-10174 03

**DOSIMETERS**

- Proton tissue dose  
LANGLEY-11802 B76-10078 05

**DOWN-CONVERTERS**

- Open-loop digital frequency multiplier  
MSC-12709 B76-10447 01

**DOWNTIME**

- Frozen-fluid line repair  
MSC-19132 B76-10227 06  
Jet engine stator-blade removal tool  
MSC-16000 B76-10420 07

**DRAWING**

- Metalworking method for composites  
M-FS-23354 B76-10132 08

**DRILL BITS**

- Method of removing drilling chips  
M-FS-19235 B76-10262 08

**DRILLING**

- Rotary broaches  
M-FS-23374 B76-10248 07  
Hand and power tools  
HQN-10892 B76-10257 07  
Method of removing drilling chips  
M-FS-19235 B76-10262 08

**DRUGS**

- Automated solvent concentrator  
NPO-13068 B76-10198 04  
Precolumn for extract concentration  
NPO-13083 B76-10199 04  
Fraction-storage unit for drug-identification system  
NPO-13111 B76-10200 04

**DRYING APPARATUS**

- Integral fan/water separator  
MSC-14756 B76-10119 07  
Low-voltage motor heater  
KSC-10651 B76-10304 01

**DUCTILITY**

- Annealing strained alloy 718  
M-FS-19242 B76-10284 08

**DUCTS**

- Double-focusing mass spectrometer  
NPO-13663 B76-10183 03  
Attenuation of sound in ducts with acoustic treatment  
LEWIS-12686 B76-10226 06  
Impedance of curved ducts  
LEWIS-12636 B76-10237 06

**DUPLEXERS**

- Solid-state RF switch  
NPO-13081 B76-10315 01

**DYE LASERS**

- Two-wavelength dye laser  
LANGLEY-12012 B76-10170 03

**DYNAMIC LOADS**

- Dynamic load attenuator  
MSC-17472 B76-10416 07  
Impact of a solid body with water  
M-FS-23512 B76-10560 06

**DYNAMIC MODULUS OF ELASTICITY**

- Ultrasonic monitoring of crack extension  
LEWIS-12632 B76-10547 06

**DYNAMIC PRESSURE**

- Indicated mean-effective pressure instrument  
LEWIS-12661 B76-10542 06

**DYNAMIC STABILITY**

- Pulse detector  
MSC-16268 B76-10557 06  
Stability of an elastic airplane  
ARC-11086 B76-10568 06  
**DYNAMOMETERS**  
Air-suspended dynamometer table  
NPO-13794 B76-10376 06

**E****EARTH RESOURCES**

- Remote sensing of natural resources  
HQN-10899 B76-10238 06  
DAM - detection and mapping  
MSC-16096 B76-10370 05

**EARTH RESOURCES INFORMATION SYSTEM**

- Remote sensing of vegetation and soil  
GSFC-11976 B76-10490 03  
CAMSP Classification and Mensuration Software Package  
MSC-14979 B76-10600 09

**ECCENTRICS**

- Heavy-duty mechanical sequencer  
MSC-19536 B76-10418 07

**ECHOCARDIOGRAPHY**

- Biomedical ultrasonoscope  
ARC-10994 B76-10537 05

**ECOLOGY**

- Quantitative bioluminescent detection of bacteria  
GSFC-12003 B76-10073 05

**EFFICIENCY**

- Learning/cost-improvement curves  
M-FS-23429 B76-10287 09

**EFFLUENTS**

- Hydrofoil controls outfall effluents in rivers and oceans  
LANGLEY-12045 B76-10488 03

**EIGENVALUES**

- Linear stochastic optimal control and estimation  
LEWIS-12505 B76-10134 09

**EIGENVECTORS**

- Linear stochastic optimal control and estimation  
LEWIS-12505 B76-10134 09  
Linear stochastic optimal control and estimation  
LEWIS-12540 B76-10607 09

**EJECTORS**

- REJECT  
LEWIS-12375 B76-10110 06

**ELASTIC BODIES**

- Impact response analyses  
M-FS-23335 B76-10559 06

**ELASTIC PROPERTIES**

- Analysis of bonded joints  
LANGLEY-11871 B76-10231 06  
Astronautic structures manual  
M-FS-23547 B76-10393 06

**ELASTOHYDRODYNAMICS**

- Fundamentals of fluid sealing  
LEWIS-12683 B76-10392 06

**ELASTOMERS**

- Permanent holographic storage medium  
M-FS-22588 B76-10044 03  
Cost saving synergistic shaft seal  
LEWIS-12119 B76-10081 06  
Reducing cold flow in elastomeric O-rings  
M-FS-24336 B76-10086 06  
Flame-resistant elastomeric polymers  
MSC-16078 B76-10357 04

**ELASTOMETERS**

- Laser extensometer  
M-FS-19259 B76-10030 03

**ELECTRETS**

- Fabrication and applications of electrets  
M-FS-23437 B76-10429 08

**ELECTRIC BATTERIES**

- Battery-cell thermal test facility  
M-FS-23040 B76-10124 08  
Compact reconditioner for Ni/Cd cells  
M-FS-23270 B76-10141 01  
Battery single-cell protection system  
LEWIS-12039 B76-10306 01

**ELECTRIC CHOPPERS**

- DC-to-DC conversion with voltage multipliers  
LEWIS-12297 B76-10138 01

**ELECTRIC CONDUCTORS**

- High-temperature flat-conductor cable  
M-FS-23451 B76-10144 01  
Testing flat-conductor cable  
M-FS-23174 B76-10151 01  
Surface mounted flat-conductor cable  
M-FS-223135 B76-10152 01  
Temperature rise of installed FCC  
M-FS-23127 B76-10153 01  
Paddle-pin alignment test  
KSC-10740 B76-10388 06

**ELECTRIC CONNECTORS**

- Electrical-splicing connector  
M-FS-24254 B76-10300 01  
Multiple-layer printed-wiring trace connector  
LANGLEY-11709 B76-10305 01  
Microprogrammable module  
MSC-19456 B76-10312 01  
Prefabricated strain-gage connectors  
MSC-19522 B76-10595 08

**ELECTRIC CONTACTS**

- Solar cell electrical connections  
LEWIS-12293 B76-10260 08  
Pulse detector  
MSC-16268 B76-10557 06

**ELECTRIC CORONA**

- Voltage control for corona charging thermoplastics  
M-FS-23102 B76-10043 03  
Electrode structure for uniform corona discharge  
M-FS-22617 B76-10045 03  
Fabrication and applications of electrets  
M-FS-23437 B76-10429 08

**ELECTRIC CURRENT**

- Determination of radiative current in LED's  
GSFC-12034 B76-10042 03

**ELECTRIC DISCHARGES**

- Elastrostatic-discharge damage to semiconductors  
LANGLEY-11739 B76-10586 08

**ELECTRIC ENERGY STORAGE**

- Composite stacked moly-permalloy cores  
NPO-13578 B76-10294 01

**ELECTRIC EQUIPMENT**

- Fluorescent-lamp power supply  
MSC-14900 B76-10140 01

**ELECTRIC EQUIPMENT TESTS**

- Paddle-pin alignment test  
KSC-10740 B76-10388 06

**ELECTRIC GENERATORS**

- Feedback arrangement for regenerative switches  
NPO-13060 B76-10302 01

**ELECTRIC IGNITION**

- Electrostatic-discharge ignition  
NPO-13798 B76-10487 03



**ELECTRIC MOTORS**

- Low-voltage motor heater  
 KSC-10651 876-10304 01  
 Ironless-armature brushless motor  
 GSFC-11880 876-10476 02  
 Induction motor analysis  
 LEWIS-12687 876-10484 02

**ELECTRIC POWER SUPPLIES**

- Foldback current-limiting for hybrid regulator  
 M-FS-22995 876-10301 01  
 Feedback arrangement for regenerative switches  
 NPO-13060 876-10302 01  
 Inductorless voltage multiplier/converter  
 NPO-13757 876-10445 01  
 Low-power programmable high-voltage supply  
 LANGLEY-11316 876-10458 01  
 Power supply with optical-isolator control  
 HQN-10827 876-10466 01

**ELECTRIC POWER TRANSMISSION**

- Free-space microwave-power transmission  
 M-FS-23443 876-10162 02

**ELECTRIC RELAYS**

- Reduction of computer power interruptions  
 MSC-16136 876-10479 02

**ELECTRIC SWITCHES**

- Plug-in light switches  
 M-FS-24183 876-10001 01

**ELECTRIC TERMINALS**

- Universal solar-cell terminal  
 M-FS-23505 876-10450 01  
 Prefabricated strain-gage connectors  
 MSC-19522 876-10595 08

**ELECTRIC WELDING**

- Synchronized backside-weld follower  
 M-FS-24454 876-10272 08

**ELECTRIC WIRE**

- High-temperature flat-conductor cable  
 M-FS-23451 876-10144 01  
 Electrical-conduit sizing gage  
 MSC-19491 876-10150 01  
 Overhead tray for cable test system  
 MSC-19488 876-10270 08  
 Universal solar-cell terminal  
 M-FS-23505 876-10450 01  
 Relative stiffness of flat-conductor cable  
 M-FS-23537 876-10469 01

**ELECTRICAL FAULTS**

- Overload-protector/fault-indicator circuit  
 NPO-13592 876-10308 01  
 Plug-in circuit monitor  
 MSC-19455 876-10311 01  
 Majority-voted logic fail-sense circuit  
 NPO-13107 876-10313 01  
 Time-domain reflectometry for cable-fault isolation  
 KSC-10741 876-10377 06  
 Paddle-pin alignment test  
 KSC-10740 876-10388 06  
 Pulse detector  
 MSC-16268 876-10557 06

**ELECTRICAL GROUNDING**

- Biased-circuit digital data line receiver  
 MSC-14967 876-10457 01

**ELECTRICAL INSULATION**

- Organic adhesives for hybrid microcircuits  
 M-FS-23370 876-10014 01  
 Improved Einzel lenses  
 M-FS-23115 876-10032 03

- High-temperature flat-conductor cable  
 M-FS-23451 876-10144 01  
 Testing flat-conductor cable  
 M-FS-23174 876-10151 01  
 Surface mounted flat-conductor cable  
 M-FS-223135 876-10152 01  
 Temperature rise of installed FCC  
 M-FS-23127 876-10153 01

**ELECTRICAL MEASUREMENT**

- Direct-reading inductance meter  
 NPO-13792 876-10473 02  
 Instrumentation for measuring low-level currents/voltages  
 MSC-14855 876-10480 02  
 Detecting contamination on a metal surface  
 M-FS-19260 876-10552 06

**ELECTRICAL PROPERTIES**

- All-tantalum electrolytic capacitor  
 M-FS-23462 876-10424 08  
 Detection of surface impurities on processed metals  
 MSC-19670 876-10553 06

**ELECTRICAL RESISTANCE**

- Resistance heating elements with specific heating profiles  
 LEWIS-10719 876-10095 06

**ELECTRO-OPTICS**

- Two-wavelength dye laser  
 LANGLEY-12012 876-10170 03  
 Tunable acoustical optical filter  
 NPO-13640 876-10340 03

**ELECTROACOUSTIC TRANSDUCERS**

- Rous system  
 LANGLEY-12015 876-10215 06  
 ROUS bolt-tensioning monitor  
 LANGLEY-12016 876-10216 06

**ELECTROCARDIOGRAPHY**

- Biomedical ultrasonoscope  
 ARC-10994 876-10537 05

**ELECTROCHEMICAL CELLS**

- Compact reconditioner for Ni/Cd cells  
 M-FS-23270 876-10141 01  
 Electrolyte cells measure oxygen fugacities  
 MSC-16089 876-10523 04

**ELECTROCHEMICAL CORROSION**

- Specific-ion electrodes for measuring Ag ions  
 MSC-14906 876-10068 04

**ELECTROCHEMICAL MACHINING**

- Electron-beam welder alignment  
 MSC-19642 876-10269 08

**ELECTROCHEMICAL OXIDATION**

- REDOX - electrochemical energy storage  
 LEWIS-12220 876-10070 04

**ELECTROCHEMISTRY**

- Specific-ion electrodes for measuring Ag ions  
 MSC-14906 876-10068 04  
 REDOX - electrochemical energy storage  
 LEWIS-12220 876-10070 04  
 Signal processing and display for electrochemical data  
 LANGLEY-11922 876-10327 02  
 Fraction collector for electrophoresis  
 M-FS-23459 876-10352 04  
 Purity test for copper-plating solutions  
 M-FS-19298 876-10360 04  
 Electrolyte cells measure oxygen fugacities  
 MSC-16089 876-10523 04

**ELECTRODEPOSITION**

- Automatic multiple applicator electrophoresis  
 ARC-10991 876-10538 05

**ELECTRODES**

- Ultra-high-vacuum electrical feedthrough  
 HQN-10799 876-10005 01  
 Improved Einzel lenses  
 M-FS-23115 876-10032 03  
 Specific-ion electrodes for measuring Ag ions  
 MSC-14906 876-10068 04  
 Metal structures with parallel pores  
 GSFC-10984 876-10131 08  
 Signal processing and display for electrochemical data  
 LANGLEY-11922 876-10327 02  
 Purity test for copper-plating solutions  
 M-FS-19298 876-10360 04  
 Disposable biomedical electrode  
 MSC-14623 876-10363 05  
 Automated EEG acquisition  
 MSC-16111 876-10364 05

**ELECTROENCEPHALOGRAPHY**

- Disposable biomedical electrode  
 MSC-14623 876-10363 05  
 Automated EEG acquisition  
 MSC-16111 876-10364 05  
 Short-range biotelemetry system  
 MSC-16011 876-10369 05

**ELECTROLYSIS**

- Hydrogen Energy A bibliography with abstracts  
 HQN-10898 876-10189 03  
 Atmosphere-generating system  
 MSC-14713 876-10389 06

**ELECTROLYTES**

- Improved wet-slug capacitor  
 LANGLEY-11720 876-10008 01

**ELECTROLYTIC CELLS**

- REDOX - electrochemical energy storage  
 LEWIS-12220 876-10070 04  
 Atmosphere-generating system  
 MSC-14713 876-10389 06

**ELECTROMAGNETIC ABSORPTION**

- Free-space microwave-power transmission  
 M-FS-23443 876-10162 02  
 Differential-optoacoustic absorption detector  
 NPO-13759 876-10494 03

**ELECTROMAGNETIC FIELDS**

- Double-focusing mass spectrometer  
 NPO-13663 876-10183 03

**ELECTROMAGNETIC NOISE**

- Improved microbridge Josephson devices  
 M-FS-23274 876-10012 01  
 Wideband distribution amplifier  
 NPO-13256 876-10307 01

**ELECTROMAGNETIC PROPERTIES**

- Time-domain reflectometry for cable-fault isolation  
 KSC-10741 876-10377 06

**ELECTROMAGNETIC RADIATION**

- Multifrequency broadband, dual-polarized antenna  
 NPO-13866 876-10464 01

**ELECTROMAGNETIC SURFACE WAVES**

- Dielectric covered antennas  
 MSC-16186 876-10471 01

**ELECTROMAGNETIC WAVE FILTERS**

- Hybrid digital-analog implementation of digital filters  
 NPO-11833 876-10299 01

RAM digital filter  
NPO-13659 876-10316 01

**ELECTROMETERS**  
Instrumentation for measuring low-level currents/voltages  
MSC-14855 876-10480 02

**ELECTROMYOGRAPHY**  
Short-range biotelemetry system  
MSC-16011 876-10369 05

**ELECTRON BEAM WELDING**  
Improved photochemical etching of stainless steel  
MSC-19728 876-10268 08

**ELECTRON BOMBARDMENT**  
Ultra-high-vacuum electrical feedthrough  
HQN-10799 876-10005 01

**ELECTRON MICROSCOPES**  
High-resolution electron microscope  
NPO-13811 876-10499 03

**ELECTRONIC CONTROL**  
Electronic circuits  
HQN-10894 876-10156 01  
Inductorless voltage multiplier/converter  
NPO-13757 876-10445 01

**ELECTRONIC EQUIPMENT**  
Fluorescent-lamp power supply  
MSC-14900 876-10140 01  
Charge-sensitive amplifier with notched frequency response  
LANGLEY-11317 876-10440 01  
Improved shelf for electronic modules  
NPO-13158 876-10578 07

**ELECTRONIC FILTERS**  
Band-elimination filter  
M-FS-23303 876-10295 01  
Charge-sensitive amplifier with notched frequency response  
LANGLEY-11317 876-10440 01  
Open-loop digital frequency multiplier  
MSC-12709 876-10447 01

**ELECTRONIC MODULES**  
Modular design of high frequency circuits  
M-FS-23408 876-10139 01  
Microprogrammable module  
MSC-19456 876-10312 01

**ELECTRONIC PACKAGING**  
Modular design of high frequency circuits  
M-FS-23408 876-10139 01  
Guidelines for multiple LSI packaging  
M-FS-23367 876-10159 01  
Multiple-layer printed-wiring trace connector  
LANGLEY-11709 876-10305 01  
Microprogrammable module  
MSC-19456 876-10312 01  
Mask analysis program  
M-FS-23431 876-10318 01  
Improved shelf for electronic modules  
NPO-13158 876-10578 07  
Parylene coating for circuit components  
M-FS-23450 876-10583 08

**ELECTRONIC TRANSDUCERS**  
Capacitive shaft-angle encoder  
ARC-10897 876-10386 06  
Miniature-angular-position transducer  
LANGLEY-11999 876-10555 06

**ELECTROPHORESIS**  
Fraction collector for electrophoresis  
M-FS-23459 876-10352 04  
Automatic multiple applicator electrophoresis  
ARC-10991 876-10538 05

**ELECTROPLATING**  
Purity test for copper-plating solutions  
M-FS-19298 876-10360 04  
Automatic multiple applicator electrophoresis  
ARC-10991 876-10538 05

**ELECTRORETINOGRAPHY**  
Disposable biomedical electrode  
MSC-14623 876-10363 05

**ELECTROSTATIC CHARGE**  
Electrostatic analysis of charge-coupled structures  
M-FS-23507 876-10472 01  
Electrostatic-discharge ignition  
NPO-13798 876-10487 03  
Elastrostatic-discharge damage to semiconductors  
LANGLEY-11739 876-10586 08

**ELEVATORS (LIFTS)**  
Cable-load equalization system  
MSC-17494 876-10230 06

**ELLIPSOMETERS**  
Ellipsometer for measurement in ultrahigh vacuum  
M-FS-23130 876-10035 03

**ELLIPTIC DIFFERENTIAL EQUATIONS**  
COMOC a finite-element algorithm for the Navier-Stokes equations  
LANGLEY-11480 876-10241 06

**ELUTION**  
Fraction collector for electrophoresis  
M-FS-23459 876-10352 04

**EMERGENCY LIFE SUSTAINING SYSTEMS**  
Miniature emergency oxygen unit  
KSC-11011 876-10539 05

**EMISSION**  
Ultra-high-vacuum electrical feedthrough  
HQN-10799 876-10005 01

**EMISSION SPECTRA**  
Determination of trace amounts of POF3  
LEWIS-10577 876-10356 04

**ENAMELS**  
Enamel for high-temperature superalloys  
M-FS-22804 876-10358 04

**ENCAPSULATING**  
Transparent and flame-retardant potting compounds  
MSC-14669 876-10066 04  
Removal of encapsulating materials  
GSFC-11696 876-10143 01  
Reduced costs for solar-cell modules  
LEWIS-12185 876-10427 08  
Thick-film preamplifier  
NPO-13416 876-10459 01  
Parylene coating for circuit components  
M-FS-23450 876-10583 08

**ENERGY ABSORPTION**  
Fluid-film bearing damper  
LEWIS-11158 876-10378 06  
Low-onset-rate energy absorber  
MSC-12279 876-10385 06  
Energy-absorbing attenuator  
MSC-17473 876-10419 07  
Energy conversion system  
NPO-13510 876-10485 03

**ENERGY ABSORPTION FILMS**  
Solar selective surfaces  
LEWIS-12614 876-10047 03  
JPL solar power experiments  
NPO-13461 876-10098 06  
Coating for solar panels  
M-FS-23420 876-10196 04

**ENERGY CONSERVATION**  
Catalysts for low-energy aldehyde processes  
NPO-13827 876-10519 04

**ENERGY CONSUMPTION**  
NECAP NASA Energy-cost analysis program  
LANGLEY-11888 876-10239 06

**ENERGY CONVERSION**  
NECAP NASA Energy-cost analysis program  
LANGLEY-11888 876-10239 06  
Proposed low-temperature solar engine  
M-FS-23403 876-10254 07  
Energy conversion system  
NPO-13510 876-10485 03

**ENERGY CONVERSION EFFICIENCY**  
Battery-cell thermal test facility  
M-FS-23040 876-10124 08  
Feedback arrangement for regenerative switches  
NPO-13060 876-10302 01

**ENERGY DISSIPATION**  
Energy-absorbing attenuator  
MSC-17473 876-10419 07

**ENERGY REQUIREMENTS**  
ESOP Version IV Energy systems optimization program  
MSC-14854 876-10106 06  
SESOP Program for solar-energy heating-systems analysis  
MSC-14853 876-10113 06  
NECAP NASA Energy-cost analysis program  
LANGLEY-11888 876-10239 06

**ENERGY SOURCES**  
Solar thermal energy utilization A bibliography with abstracts  
HQN-10900 876-10186 03

**ENERGY STORAGE**  
REDOX - electrochemical energy storage  
LEWIS-12220 876-10070 04

**ENERGY TRANSFER**  
NECAP NASA Energy-cost analysis program  
LANGLEY-11888 876-10239 06  
Energy conversion system  
NPO-13510 876-10485 03

**ENGINE ANALYZERS**  
DYNGEN  
LEWIS-12506 876-10108 06

**ENGINE NOISE**  
Noise suppressor for turbofan-jet engines  
ARC-10812 876-10375 06

**ENGINES**  
Improved automobile gas turbine engine  
LEWIS-12521 876-10115 07  
Proposed low-temperature solar engine  
M-FS-23403 876-10254 07

**ENVIRONMENTAL PROTECTION**  
Catalytic oxidation of waste materials  
MSC-14831 876-10354 04

**ENVIRONMENTAL ENGINEERING**  
Solar heating and cooling performance  
M-FS-23432 876-10235 06  
NASA technology utilization house  
LANGLEY-12134 876-10570 07

**ENVIRONMENTAL QUALITY**  
Contamination monitoring of fluids  
KSC-11037 876-10382 06  
Extracting lignins from mill wastes  
NPO-13847 876-10514 04

**ENVIRONMENTAL SURVEYS**

Remote sensing of vegetation and soil  
GSFC-11976 B76-10490 03

**ENVIRONMENTAL TESTS**

Mechanical loader for testing  
composites  
LEWIS-12432 B76-10548 06  
Pulse detector  
MSC-16268 B76-10557 06

**ENZYMES**

Extraction of urea and ammonium ion  
ARC-11064 B76-10515 04

**EPHEMERIDES**

Development ephemeris number 96  
NPO-14002 B76-10507 03  
Independent trajectory determination  
system  
GSFC-11923 B76-10569 06

**EPHEMERIS TIME**

SANDTRACKS World map and stations  
predictions computer programs  
GSFC-12099 B76-10190 03

**EPITAXY**

Epitaxial growth of Ga1-xAlxAs on GaP  
GSFC-11826 B76-10261 08  
Semiconductor ohmic contact  
LANGLEY-11691 B76-10461 01

**EPOXY COMPOUNDS**

Specific-ion electrodes for measuring Ag  
ions  
MSC-14906 B76-10068 04

**EPOXY RESINS**

Polymer adhesives for hybrid circuits  
M-FS-23287 B76-10015 01  
Solventless intumescent coatings  
ARC-10996 B76-10194 04  
Low-pressure low-temperature molding  
process  
MSC-19778 B76-10425 08  
New diamine hardeners for epoxies  
LANGLEY-11823 B76-10522 04  
Aluminum transfer method for plating  
plastics  
MSC-16221 B76-10593 08

**EQUATIONS OF MOTION**

Determining aircraft stability and control  
derivatives  
FRC-10109 B76-10402 06

**EQUATIONS OF STATE**

Processing equations for state-space  
models  
LEWIS-12555 B76-10438 09

**EQUIPMENT**

Input/output error analyzer  
GSFC-12132 B76-10610 09

**ERROR ANALYSIS**

Guide for testing numerical-integration  
subroutines  
NPO-11644 B76-10135 09

**ERROR CORRECTING CODES**

Concatenated algebraic decoder  
MSC-14058 B76-10325 02  
Interleaved cyclic codes  
KSC-11040 B76-10435 09

**ERROR CORRECTING DEVICES**

Stepping optical path difference in an  
interferometer  
NPO-13569 B76-10033 03  
Servo corrects interferometer-mirror tilt  
NPO-13687 B76-10502 03

**ERROR DETECTION CODES**

Microprogramming for real-time data  
acquisition  
KSC-11027 B76-10328 02  
Serial-data correlator/code translator  
KSC-11025 B76-10454 01

Code-usage analysis system

MSC-16214 B76-10603 09  
FORTRAN code-evaluation system  
M-FS-23539 B76-10604 09

**ERROR SIGNALS**

Stepping optical path difference in an  
interferometer  
NPO-13569 B76-10033 03

**ERRORS**

Input/output error analyzer  
GSFC-12132 B76-10610 09

**ESCAPE SYSTEMS**

Improved road handler  
M-FS-23233 B76-10413 07

**ETCHING**

Electron-beam welder alignment  
MSC-19642 B76-10269 08  
Elimination of color rings on film  
negatives  
GSFC-12110 B76-10498 03  
Crystal orientation for solid-state  
photolithography  
LANGLEY-11940 B76-10582 08

**ETHYL ALCOHOL**

Stripper for silicone polymers  
MSC-19380 B76-10267 08

**EULER EQUATIONS OF MOTION**

Analytic numerical solutions for shock  
waves  
ARC-10959 B76-10096 06

**EUTECTIC ALLOYS**

Growing crystals from eutectic melts  
M-FS-22926 B76-10202 04  
Determining eutectic composition in  
metal alloys  
LEWIS-12633 B76-10520 04

**EUTECTICS**

Determining eutectic composition in  
metal alloys  
LEWIS-12633 B76-10520 04

**EVAPORATIVE COOLING**

Sublimator/evaporator heat sink  
ARC-10912 B76-10384 06

**EVAPORATORS**

Integral fan/water separator  
MSC-14756 B76-10119 07

**EXHAUST NOZZLES**

REJECT  
LEWIS-12375 B76-10110 06  
Noise suppressor for turbofan-jet  
engines  
ARC-10812 B76-10375 06

**EXHAUST SYSTEMS**

Conical diffuser for fuel cells  
MSC-14026 B76-10255 07

**EXPLOSIVE WELDING**

Simplified explosive-weld evaluation  
MSC-14654 B76-10228 06  
Polishing gold and gold-alloy crystals  
M-FS-22800 B76-10263 08  
Explosive-seam welding seals large  
pressure vessels  
LANGLEY-12132 B76-10588 08

**EXTENSOMETERS**

Laser extensometer  
M-FS-19259 B76-10030 03

**EXTRACTION**

DIP extractor simplifies circuit removal  
MSC-12712 B76-10002 01  
Integral fan/water separator  
MSC-14756 B76-10119 07  
Fraction collector for electrophoresis  
M-FS-23459 B76-10352 04

**EXTREMUM VALUES**

Peak-acceleration limiter  
NPO-11940 B76-10082 06

**EXTRUDING**

Metal structures with parallel pores  
GSFC-10984 B76-10131 08  
Metalworking method for composites  
M-FS-23354 B76-10132 08  
Manufacture of flat-conductor cable  
M-FS-23121 B76-10155 01

**F****FABRICATION**

Polymer adhesives for hybrid circuits  
M-FS-23287 B76-10015 01  
Lightweight orthotic appliances  
LANGLEY-11918 B76-10076 05  
Metal structures with parallel pores  
GSFC-10984 B76-10131 08  
Transistor-to-substrate bond quality  
M-FS-21931 B76-10137 01  
Solid-state particle detectors  
GSFC-11785 B76-10142 01  
Connector contact-ring bus  
MSC-19480 B76-10146 01  
Flat-conductor cable baseboard  
M-FS-23141 B76-10154 01  
Manufacture of flat-conductor cable  
M-FS-23121 B76-10155 01  
Installation of surface-mounted  
flat-conductor cable  
M-FS-23266 B76-10158 01  
IGFET/SOI fabrication method  
M-FS-23312 B76-10259 08  
Epitaxial growth of Ga1-xAlxAs on GaP  
GSFC-11826 B76-10261 08  
Method of removing drilling chips  
M-FS-19235 B76-10262 08  
3-D foam adhesive deposition  
M-FS-22739 B76-10271 08  
Ablative-filled honeycomb composites  
LANGLEY-11180 B76-10273 08  
Borosilicate glass-to-Kovar tube  
bonding  
GSFC-12077 B76-10278 08  
Technique for joining metal tubing  
ARC-10946 B76-10279 08  
Annealing strained alloy 718  
M-FS-19242 B76-10284 08

**FABRY-PEROT INTERFEROMETERS**

Precision measurement of changes in  
physical dimensions  
M-FS-23527 B76-10543 06

**FACSIMILE COMMUNICATION**

Binary/BCD-to-ASCII data converter  
GSFC-12044 B76-10322 02

**FAIL-SAFE SYSTEMS**

Fail-safe hydraulic shaker protection  
NPO-13726 B76-10218 06  
Majority-voted logic fail-sense circuit  
NPO-13107 B76-10313 01  
Safety brake for tape reels  
GSFC-11960 B76-10412 07

**FAILURE**

Overload-protector/fault-indicator circuit  
NPO-13592 B76-10308 01  
Plug-in circuit monitor  
MSC-19455 B76-10311 01

**FAILURE ANALYSIS**

Pump failure monitor  
M-FS-23366 B76-10219 06  
Prevention of design flaws in  
multicomputer systems  
MSC-14920 B76-10330 02

**FAILURE MODES**

Ultra-lightweight pressure vessels  
MSC-14983 B76-10266 08

**FASTENERS**

- Large-diameter fasteners of CRES alloy  
MSC-19313 876-10250 07
- Electrical-splicing connector  
M-FS-24254 876-10300 01
- Astronautic structures manual  
M-FS-23547 876-10393 06
- Door latch with through-access hole  
MSC-19634 876-10414 07
- Controlled linear clasper/loader  
GSFC-12105 876-10432 08
- Transducer bonding kit  
MSC-19690 876-10587 08

**FATIGUE (MATERIALS)**

- Analysis of bonded joints  
LANGLEY-11871 876-10231 06
- Crack-growth analysis  
M-FS-23320 876-10243 06
- Fracture mechanics for weld acceptance  
M-FS-23360 876-10282 08
- Astronautic structures manual  
M-FS-23547 876-10393 06

**FATIGUE LIFE**

- Fatigue life of spur and helical gear sets  
LEWIS-12596 876-10224 06

**FATIGUE TESTS**

- Fracture mechanics for weld acceptance  
M-FS-23360 876-10282 08

**FEEDBACK CIRCUITS**

- M-ary shift register  
NPO-11868 876-10011 01
- Demodulator aids synchronization  
NPO-13605 876-10164 02
- A nonsaturating dc-to-dc parallel power converter  
GSFC-12047 876-10290 01
- Rocking-motion sensor for the blind  
MSC-14805 876-10366 05

**FEEDBACK CONTROL**

- M-ary shift register  
NPO-11868 876-10011 01
- Stepping optical path difference in an interferometer  
NPO-13569 876-10033 03
- Stabilized Nd YAG laser output  
GSFC-11571 876-10335 03
- Control system design  
LEWIS-12556 876-10404 06

**FEEDERS**

- Propellant side feed  
LANGLEY-11082 876-10094 06

**FERROFLUIDS**

- Air-suspended dynamometer table  
NPO-13794 876-10376 06

**FERROMAGNETIC FILMS**

- Triple-layer bubble-domain film  
LANGLEY-11755 876-10006 01

**FERROMAGNETISM**

- Analog data recording on MnBi film  
NPO-13302 876-10175 03
- Simplified cut-core inductor  
NPO-13600 876-10317 01

**FERROUS METALS**

- Large-diameter fasteners of CRES alloy  
MSC-19313 876-10250 07

**FIBER OPTICS**

- Improved collimator for imaging system  
M-FS-22863 876-10038 03
- Optical bias assembly  
MSC-14412 876-10051 03
- Vidicon intensifier  
NPO-19112 876-10054 03
- Low-light-level integrating video system  
M-FS-23288 876-10347 03

**FIBER ORIENTATION**

- Composite laminate warpage  
LEWIS-12615 876-10355 04

**FIBERS**

- Flexible-pile thermal sealant  
MSC-19568 876-10371 06

**FIELD EFFECT TRANSISTORS**

- IGFET/SOI fabrication method  
M-FS-23312 876-10259 08
- Elastrostatic-discharge damage to semiconductors  
LANGLEY-11739 876-10586 08

**FILE MAINTENANCE (COMPUTERS)**

- Business capabilities file  
NPO-13834 876-10136 09
- Data-management and information system  
NPO-13716 876-10602 09
- Information retrieval and display system  
M-FS-23510 876-10606 09

**FILM COOLING**

- Noncontaminating method for visualizing gas flow  
LEWIS-12076 876-10088 06

**FILM THICKNESS**

- Analog data recording on MnBi film  
NPO-13302 876-10175 03
- Detecting contamination on a metal surface  
M-FS-19260 876-10552 06

**FILMS**

- Abrasion-resistant coatings for plastic surfaces  
ARC-10915 876-10201 04

**FILTERS**

- Pinhole diffraction filter  
GSFC-12120 876-10333 03

**FINNED BODIES**

- Spin-rate control device  
ARC-10884 876-10417 07
- Heat-transfer coefficients of pin-finned cylinders  
LEWIS-12557 876-10554 06

**FINS**

- Hand fin for swimming  
M-FS-21632 876-10122 07

**FIRE FIGHTING**

- Automatic fire/weather data station  
ARC-10993 876-10160 02

**FIRE PREVENTION**

- Ultraviolet fire detector  
M-FS-21577 876-10016 02
- Experimental data for new fire-retardant materials  
MSC-16022 876-10361 04

**FIREPROOFING**

- Transparent and flame-retardant potting compounds  
MSC-14669 876-10066 04
- Flame-resistant elastomeric polymers  
MSC-16078 876-10357 04
- Experimental data for new fire-retardant materials  
MSC-16022 876-10361 04

**FIRST AID**

- Physician's modern 'Black Bag'  
MSC-14936 876-10212 05
- Multiposition rescue litter  
MSC-16148 876-10368 05
- Interlocking butterfly tourniquet  
MSC-19382 876-10532 05
- Miniature emergency oxygen unit  
KSC-11011 876-10539 05

**FITTINGS**

- Tool removes brazed fittings  
LANGLEY-10944 876-10244 07

- Flexible fitting for fluid lines  
MSC-17780 876-10277 08
- Soft seat A-N fitting for vacuum use  
LEWIS-10130 876-10408 07

**FIXTURES**

- Method of removing drilling chips  
M-FS-19235 876-10262 08
- Modular multipurpose panel support  
MSC-19641 876-10421 08
- Flange weld pressure testing  
M-FS-19292 876-10546 06

**FLAME RETARDANTS**

- Flame-resistant elastomeric polymers  
MSC-16078 876-10357 04
- Flexible-pile thermal sealant  
MSC-19568 876-10371 06

**FLAT CONDUCTORS**

- High-temperature flat-conductor cable  
M-FS-23451 876-10144 01
- Testing flat-conductor cable  
M-FS-23174 876-10151 01
- Surface mounted flat-conductor cable  
M-FS-223135 876-10152 01
- Temperature rise of installed FCC  
M-FS-23127 876-10153 01
- Flat-conductor cable baseboard  
M-FS-23141 876-10154 01
- Manufacture of flat-conductor cable  
M-FS-23121 876-10155 01
- Installation of surface-mounted flat-conductor cable  
M-FS-23266 876-10158 01
- Microprogramable module  
MSC-19456 876-10312 01
- Relative stiffness of flat-conductor cable  
M-FS-23537 876-10469 01

**FLAT PLATES**

- Outer flow and turbulence in boundary layers  
M-FS-23286 876-10100 06

**FLEXIBILITY**

- Relative stiffness of flat-conductor cable  
M-FS-23537 876-10469 01

**FLIGHT ALTITUDE**

- Low-cost pressure-data encoder  
NPO-13692 876-10303 01

**FLIGHT HAZARDS**

- Experimental data for new fire-retardant materials  
MSC-16022 876-10361 04

**FLIGHT MECHANICS**

- Estimating aircraft states  
ARC-10969 876-10567 06
- Stability of an elastic airplane  
ARC-11086 876-10568 06

**FLIGHT SIMULATION**

- Multiplane binocular visual display system  
ARC-10808 876-10168 02

**FLIGHT SIMULATORS**

- Full-color hybrid display  
ARC-10903 876-10477 02

**FLIGHT TRAINING**

- Multiplane binocular visual display system  
ARC-10808 876-10168 02

**FLOOD PLAINS**

- Data system for multiplexed water-current meters  
M-FS-23343 876-10493 03

**FLOW CHARACTERISTICS**

- Predicting off-design performance of radial-inflow turbines  
LEWIS-12500 876-10242 06

- Integral-matrix procedure for  
boundary-layer problems  
M-FS-23348 876-10608 09
- FLOW DIRECTION INDICATORS**  
Velocity sensor for slow flows  
LANGLEY-11785 876-10380 06
- FLOW DISTRIBUTION**  
**REJECT**  
LEWIS-12375 876-10110 06  
Shock interference patterns and heating  
LANGLEY-11497 876-10240 06  
Conical diffuser for fuel cells  
MSC-14026 876-10255 07
- FLOW GEOMETRY**  
Design analysis of radial-inflow turbines  
LEWIS-12684 876-10561 06
- FLOW MEASUREMENT**  
Introducing controlled matter into a fluid  
system  
M-FS-24309 876-10093 06  
All-nickel hot-wire probe  
ARC-10911 876-10379 06  
Velocity sensor for slow flows  
LANGLEY-11785 876-10380 06  
Automated secondary standard for liquid  
flowmeters  
LEWIS-12695 876-10544 06
- FLOW REGULATORS**  
Firefighter's breathing system  
MSC-14733 876-10208 05
- FLOW THEORY**  
COMOC a finite-element algorithm for  
the Navier-Stokes equations  
LANGLEY-11480 876-10241 06
- FLOW VELOCITY**  
Velocity sensor for slow flows  
LANGLEY-11785 876-10380 06
- FLOWMETERS**  
Constant-rate fluid-delivery system  
MSC-14905 876-10214 06  
Data system for multiplexed  
water-current meters  
M-FS-23343 876-10493 03  
Automated secondary standard for liquid  
flowmeters  
LEWIS-12695 876-10544 06
- FLUID DYNAMICS**  
Noncontaminating method for visualizing  
gas flow  
LEWIS-12076 876-10088 06  
Outer flow and turbulence in boundary  
layers  
M-FS-23286 876-10100 06  
Hot-wire probe  
ARC-10900 876-10222 06  
Contamination monitoring of fluids  
KSC-11037 876-10382 06  
Integral-matrix procedure for  
boundary-layer problems  
M-FS-23348 876-10608 09
- FLUID FILMS**  
Fluid-film bearing damper  
LEWIS-11158 876-10378 06
- FLUID FILTERS**  
Automated solvent concentrator  
NPO-13068 876-10198 04  
Precolumn for extract concentration  
NPO-13083 876-10199 04  
Fluid handling equipment  
HQN-10890 876-10232 06
- FLUID FLOW**  
Noncontaminating method for visualizing  
gas flow  
LEWIS-12076 876-10088 06  
Introducing controlled matter into a fluid  
system  
M-FS-24309 876-10093 06
- Constant-rate fluid-delivery system  
MSC-14905 876-10214 06  
Fluid handling equipment  
HQN-10890 876-10232 06  
Impedance of curved ducts  
LEWIS-12636 876-10237 06  
Transient thermal analysis of fluid  
systems  
MSC-19502 876-10401 06  
Rapid kinetics  
LANGLEY-12140 876-10529 04  
Automated secondary standard for liquid  
flowmeters  
LEWIS-12695 876-10544 06  
Dispensing a measured quantity of a  
liquid  
M-FS-21163 876-10574 07
- FLUID INJECTION**  
Introducing controlled matter into a fluid  
system  
M-FS-24309 876-10093 06
- FLUID MECHANICS**  
Constant-rate fluid-delivery system  
MSC-14905 876-10214 06  
Shock interference patterns and heating  
LANGLEY-11497 876-10240 06  
COMOC a finite-element algorithm for  
the Navier-Stokes equations  
LANGLEY-11480 876-10241 06  
Hydrodynamic lubrication of face seals  
LEWIS-12710 876-10558 06
- FLUID TRANSMISSION LINES**  
Frozen-fluid line repair  
MSC-19132 876-10227 06  
Flexible fitting for fluid lines  
MSC-17780 876-10277 06
- FLUIDIC CIRCUITS**  
Vapor/liquid interface sensor  
MSC-12474 876-10220 06
- FLUIDICS**  
Frozen-fluid line repair  
MSC-19132 876-10227 06
- FLUORESCENCE**  
Inexpensive portable drug detector  
ARC-10633 876-10534 05
- FLUORINE ORGANIC COMPOUNDS**  
Flame-resistant elastomeric polymers  
MSC-16078 876-10357 04
- FLUORO COMPOUNDS**  
High-temperature flat-conductor cable  
M-FS-23451 876-10144 01
- FLUOROHYDROCARBONS**  
Antireflection coating for plastic lenses  
ARC-10983 876-10591 08
- FLUSHING**  
Cleaning large tanks and gas bottles  
MSC-14966 876-10430 09
- FLUX DENSITY**  
Analog data recording on MnBi film  
NPO-13302 876-10175 03
- FLUXES**  
Braze/Rebraze process for CRES steel  
MSC-19600 876-10280 08
- FLYING SPOT SCANNERS**  
Remote, unattended forest fire  
detector  
M-FS-21221 876-10077 05
- FM/PM (MODULATION)**  
Tracking a phase-shift-keyed signal  
MSC-16170 876-10481 02
- FOAMS**  
Polymeric foams stable at high  
temperatures  
ARC-11008 876-10065 04  
Thermal/acoustical insulation foam  
MSC-14795 876-10195 04
- 3-D foam adhesive deposition  
M-FS-22739 876-10271 08  
Flame-resistant elastomeric polymers  
MSC-16078 876-10357 04  
Viscoelastic foam cushion  
ARC-11089 876-10525 04  
Mixing ingredients in foam dispenser  
M-FS-20607 876-10592 08
- FOCUSING**  
Contrast enhancement of transparencies  
GSFC-11989 876-10181 03
- FOLDING STRUCTURES**  
Multiposition rescue litter  
MSC-16148 876-10368 05
- FORECASTING**  
Estimation of spares  
MSC-19469 876-10133 09
- FOREST FIRE DETECTION**  
Ultraviolet fire detector  
M-FS-21577 876-10016 02  
Remote unattended, forest fire detector  
M-FS-21221 876-10077 05
- FOREST FIRES**  
Remote moisture-content balance  
ARC-11032 876-10492 03
- FORMING TECHNIQUES**  
Low-cost solar reflectors  
NPO-13707 876-10123 08  
Roll-forming tubes to header plates  
LEWIS-10513 876-10130 08  
Age-forming aluminum panels  
MSC-12648 876-10281 08  
Forming hard aluminum in complex  
shapes  
MSC-19693 876-10579 08
- FORMULAS (MATHEMATICS)**  
Field distribution in a thin lens  
LANGLEY-11392 876-10179 03
- FORTRAN**  
Meta-assembler  
M-FS-23449 876-10437 09
- FORWARD SCATTERING**  
A forward-scatter polarimeter for  
chemical analysis  
NPO-13756 876-10334 03  
Dual-purpose holocamera  
LEWIS-12166 876-10505 03
- FOSSIL FUELS**  
Stopping small liquid leaks  
KSC-10667 876-10126 08  
Hydrogen Energy A bibliography with  
abstracts  
HQN-10898 876-10189 03
- FOURIER ANALYSIS**  
Time-domain aircraft model  
MSC-16018 876-10391 06  
Transfer-function parameters  
LEWIS-12612 876-10605 09  
Systems improved numerical differencing  
analyzer  
MSC-13805 876-10609 09
- FRACTURE MECHANICS**  
Astronautic structures manual  
M-FS-23547 876-10393 06
- FRACTURE STRENGTH**  
Ultrasonic measurement of fracture  
toughness  
LEWIS-12642 876-10372 06  
Yield-pressure determination  
MSC-14655 876-10581 08
- FRAUNHOFER LINES**  
Spatially-coherent coupled  
semiconductor lasers  
M-FS-23396 876-10500 03

**FREE CONVECTION**

Transient thermal analysis of fluid systems

MSC-19502 876-10401 06

**FREE FLOW**

MINIVER Miniature version of real/ideal gas aero-heating and ablation computer program

M-FS-21951 876-10105 06

**FREE RADICALS**

Chemiluminescent prediction of service life

MSC-16010 876-10191 04

**FREEZING**

Frozen-fluid line repair

MSC-19132 876-10227 06

**FREIGHT COSTS**

DORCA II Dynamic operations requirements and cost analysis program

HQN-10834 876-10289 09

**FREQUENCY CONTROL**

Band-elimination filter

M-FS-23303 876-10295 01

Digital varying-frequency generator

MSC-16331 876-10446 01

Open-loop digital frequency multiplier

MSC-12709 876-10447 01

**FREQUENCY MODULATION**

Digital varying-frequency generator

MSC-16331 876-10446 01

**FREQUENCY MULTIPLIERS**

Open-loop digital frequency multiplier

MSC-12709 876-10447 01

**FREQUENCY STABILITY**

Wideband distribution amplifier

NPO-13256 876-10307 01

Stabilized Nd YAG laser output

GSFC-11571 876-10335 03

**FREQUENCY SYNTHESIZERS**

Doppler extraction with a digital VCO

MSC-14814 876-10452 01

**FROGS**

Extraction of urea and ammonium ion

ARC-11064 876-10515 04

**FROZEN FOODS**

Meal system for the elderly

MSC-16062 876-10530 05

**FUEL CELLS**

REDOX - electrochemical energy storage

LEWIS-12220 876-10070 04

Conical diffuser for fuel cells

MSC-14026 876-10255 07

Fuel-cell powerplant insulation

MSC-16012 876-10426 08

Energy conversion system

NPO-13510 876-10485 03

**FUEL CONTROL**

AC adapter for fuel-flow sensor

GSFC-12037 876-10387 06

**FUEL GAGES**

AC adapter for fuel-flow sensor

GSFC-12037 876-10387 06

**FUEL OILS**

AC adapter for fuel-flow sensor

GSFC-12037 876-10387 06

**FUEL SYSTEMS**

Conical diffuser for fuel cells

MSC-14026 876-10255 07

**FUEL TESTS**

Determining total carbon in hydrazine

KSC-11022 876-10521 04

**FUEL VALVES**

Long-life ball-valve design

M-FS-19282 876-10576 07

**FUEL-AIR RATIO**

Sustained-arc ignition system

LEWIS-12444 876-10410 07

Electrostatic-discharge ignition

NPO-13798 876-10487 03

**FUNCTIONS (MATHEMATICS)**

Curvilinear bicubic-spline-fit

interpolation

LANGLEY-11391 876-10434 09

Transfer-function parameters

LEWIS-12612 876-10605 09

**FURNACES**

Improved high-temperature heater with stabilized-zirconia elements

M-FS-23351 876-10221 06

**G****GALLIUM ARSENIDE LASERS**

Determination of radiative current in

LED s

GSFC-12034 876-10042 03

Combined GaAs laser outputs

M-FS-23397 876-10173 03

Semiconductor ohmic contact

LANGLEY-11691 876-10461 01

Spatially-coherent coupled

semiconductor lasers

M-FS-23396 876-10500 03

**GALLIUM ARSENIDES**

Low-threshold light-emitting-diode laser

LANGLEY-11477 876-10176 03

Epitaxial growth of Ga1-xAlxAs on GaP

GSFC-11826 876-10261 08

**GALLIUM PHOSPHIDES**

Epitaxial growth of Ga1-xAlxAs on GaP

GSFC-11826 876-10261 08

**GARBAGE**

Manual trash compactor

MSC-16039 876-10390 06

**GARNETS**

Triple-layer bubble-domain film

LANGLEY-11755 876-10006 01

**GAS ANALYSIS**

Field sampling fine-vacuum system

KSC-10596 876-10118 07

Signal processing and display for

electrochemical data

LANGLEY-11922 876-10327 02

A forward-scatter polarimeter for

chemical analysis

NPO-13756 876-10334 03

Remote water-monitoring system

LANGLEY-11973 876-10365 05

Measuring trace dispersants in gas

streams

ARC-10896 876-10374 06

Improved gas-pressure transducer

ARC-10639 876-10381 06

Low-pressure-gas sampling pump

ARC-10941 876-10573 07

**GAS CHROMATOGRAPHY**

Automated solvent concentrator

NPO-13068 876-10198 04

Fraction-storage unit for

drug-identification system

NPO-13111 876-10200 04

Separation of water from air samples

ARC-10890 876-10205 04

**GAS COOLING**

Noncontaminating method for visualizing

gas flow

LEWIS-12076 876-10088 06

**GAS DENSITY**

A forward-scatter polarimeter for

chemical analysis

NPO-13756 876-10334 03

Improved gas-pressure transducer

ARC-10639 876-10381 06

**GAS DETECTORS**

Hydrogen chloride test set

M-FS-23357 876-10063 04

**GAS DYNAMICS**

Noncontaminating method for visualizing

gas flow

LEWIS-12076 876-10088 06

Impedance of curved ducts

LEWIS-12636 876-10237 06

Rapid kinetics

LANGLEY-12140 876-10529 04

**GAS FLOW**

Noncontaminating method for visualizing

gas flow

LEWIS-12076 876-10088 06

Joule-Thomson data curves

KSC-10538 876-10102 06

Venting for condensation in gas lines

MSC-19621 876-10109 06

Measuring trace dispersants in gas

streams

ARC-10896 876-10374 06

Velocity sensor for slow flows

LANGLEY-11785 876-10380 06

Rapid kinetics

LANGLEY-12140 876-10529 04

**GAS IONIZATION**

Spatial filter for Q-switched laser

LEWIS-12164 876-10501 03

**GAS LASERS**

Efficient copper-vapor pulsed laser

NPO-13449 876-10341 03

Spatial filter for Q-switched laser

LEWIS-12164 876-10501 03

**GAS MIXTURES**

Multispecies transient simulator

MSC-14862 876-10527 04

Rapid kinetics

LANGLEY-12140 876-10529 04

**GAS PRESSURE**

Gas boost compressor

MSC-14757 876-10415 07

**GAS SPECTROSCOPY**

Borosilicate glass-to-Kovar tube

bonding

GSFC-12077 876-10278 08

**GAS STREAMS**

Integral-matrix procedure for

boundary-layer problems

M-FS-23348 876-10608 09

**GAS TURBINE ENGINES**

Improved automobile gas turbine

engine

LEWIS-12521 876-10115 07

Design analysis of radial-inflow turbines

LEWIS-12684 876-10561 06

**GAS TURBINES**

Improved automobile gas turbine

engine

LEWIS-12521 876-10115 07

**GAS VALVES**

Firefighter's breathing system

MSC-14733 876-10208 05

**GASES**

Field sampling fine-vacuum system

KSC-10596 876-10118 07

**GASKETS**

Split-ring seal

MSC-14304 876-10247 07

Fundamentals of fluid sealing

LEWIS-12683 876-10392 06

**GATES (CIRCUITS)**

- Signal level detector  
NPO-13272 876-10310 01  
Solid-state RF switch  
NPO-13081 876-10315 01

**GEARS**

- Fatigue life of spur and helical gear sets  
LEWIS-12596 876-10224 06

**GEODETIC COORDINATES**

- GEODYN Orbital and geodetic parameter estimation  
GSFC-12014 876-10396 06  
Geodetic control net  
NPO-13718 876-10510 03

**GEODETIC SATELLITES**

- Geodetic control net  
NPO-13718 876-10510 03

**GEOPHYSICS**

- GEODYN Orbital and geodetic parameter estimation  
GSFC-12014 876-10396 06

**GEOTHERMAL RESOURCES**

- Remote sensing of natural resources  
HQN-10899 876-10238 06  
Economical solar-heating for homes  
LANGLEY-12135 876-10571 07

**GERIATRICS**

- Meal system for the elderly  
MSC-16062 876-10530 05

**GERONTOLOGY**

- Meal system for the elderly  
MSC-16062 876-10530 05

**GLANDS (SEALS)**

- Split-ring seal  
MSC-14304 876-10247 07

**GLASS**

- Low-cost solar reflectors  
NPO-13707 876-10123 08

**GLASSWARE**

- Leak testing glass ampoules  
LANGLEY-11988 876-10551 06

**GOLD**

- Soldering high-impedance Nichrome wire  
M-FS-1457 876-10264 08

**GOLD ALLOYS**

- Soldering high-impedance Nichrome wire  
M-FS-1457 876-10264 08

**GONIOMETERS**

- Capacitive shaft-angle encoder  
ARC-10897 876-10386 06

**GRAPHITE**

- Lightweight orthotic appliances  
LANGLEY-11918 876-10076 05  
Second-generation PMR polyimides  
LEWIS-12738 876-10359 04

**GRAPHS (CHARTS)**

- Graphical methods for variable sampling plans  
MSC-19279 876-10431 08  
Oblique orthographic projections and contour plots  
LANGLEY-11877 876-10601 09

**GRATINGS (SPECTRA)**

- Holography with surface plasma waves  
M-FS-22040 876-10039 03

**GROOVING**

- Rotary broaches  
M-FS-23374 876-10248 07

**GROUND EFFECT MACHINES**

- Air-cushion landing systems  
LANGLEY-11783 876-10397 06

**GROUND HANDLING**

- Omnidirectional wheel  
M-FS-21309 876-10575 07

**GROUND STATIONS**

- All-weather ice information system  
LEWIS-12638 876-10018 02

**GROUND SUPPORT EQUIPMENT**

- Jet engine stator-blade removal tool  
MSC-16000 876-10420 07

**GROUND WIND**

- Crosswind landing-gear position indicator  
LANGLEY-11941 876-10120 07

**GROUP VELOCITY**

- Effects of mismatch on group delay of microwave transmission  
NPO-13863 876-10478 02

**GUARDS (SHIELDS)**

- Increased safety in mercury-containing devices  
M-FS-23308 876-10013 01

**GUIDANCE SENSORS**

- Infrared range sensor  
ARC-10885 876-10475 02

**GUST ALLEVIATORS**

- Gust alleviation for STOL aircraft  
LANGLEY-11413 876-10099 06

**H****H WAVES**

- Multifrequency broadband, dual-polarized antenna  
NPO-13866 876-10464 01

**HANDLING EQUIPMENT**

- Aseptic fluid-transfer system  
NPO-13743 876-10210 05

**HARDENERS**

- New diamine hardeners for epoxies  
LANGLEY-11823 876-10522 04

**HARDENING (MATERIALS)**

- Forming hard aluminum in complex shapes  
MSC-19693 876-10579 08

- Electric heating for metal surface hardening  
M-FS-19268 876-10580 08

**HARDWARE**

- Nondestructive interior examination of moving parts  
M-FS-23378 876-10545 06

**HARMONIC MOTION**

- Effects of mismatch on group delay of microwave transmission  
NPO-13863 876-10478 02

**HARNESSES**

- Firefighter's breathing system  
MSC-14733 876-10208 05

**HAZARDS**

- Safety organizations and experts  
LEWIS-12742 876-10598 09

**HEAD MOVEMENT**

- Measuring mandibular motions  
ARC-10956 876-10362 05

**HEART**

- Myocardial wall-thickness transducer  
NPO-13644 876-10075 05

**HEAT BUDGET**

- NECAP NASA Energy-cost analysis program  
LANGLEY-11888 876-10239 06

**HEAT EXCHANGERS**

- Self-contained constant-temperature heat absorber  
M-FS-22989 876-10091 06  
Sublimator/evaporator heat sink  
ARC-10912 876-10384 06

- Heat-transfer coefficients of pin-finned cylinders  
LEWIS-12557 876-10554 06

**HEAT FLUX**

- Measurement of rapidly-changing heating rates  
LANGLEY-11380 876-10097 06  
Self-calibrating radiometer  
ARC-10811 876-10339 03

**HEAT GENERATION**

- Resistance heating elements with specific heating profiles  
LEWIS-10719 876-10095 06  
Solar thermal energy utilization A bibliography with abstracts  
HQN-10900 876-10186 03  
Economical solar-heating for homes  
LANGLEY-12135 876-10571 07

**HEAT MEASUREMENT**

- Measurement of rapidly-changing heating rates  
LANGLEY-11380 876-10097 06

**HEAT PIPES**

- 'Thermal-diode' heat pipe  
ARC-10997 876-10223 06  
Heat pipe technology  
HQN-10901 876-10233 06

**HEAT RADIATORS**

- 'Thermal-diode' heat pipe  
ARC-10997 876-10223 06

**HEAT RESISTANT ALLOYS**

- All-nickel hot-wire probe  
ARC-10911 876-10379 06

**HEAT SHIELDING**

- Thermal insulation for high-temperature systems  
GSFC-10954 876-10064 04  
Shock-tube driver  
NPO-13528 876-10090 06  
Thermal/acoustical insulation foam  
MSC-14795 876-10195 04  
Cryogenic storage tank thermal analysis  
MSC-19103 876-10234 06

**HEAT SINKS**

- Transistor-to-substrate bond quality  
M-FS-21931 876-10137 01  
Sublimator/evaporator heat sink  
ARC-10912 876-10384 06

**HEAT SOURCES**

- Self-calibrating radiometer  
ARC-10811 876-10339 03  
Energy conversion system  
NPO-13510 876-10485 03

**HEAT STORAGE**

- NECAP NASA Energy-cost analysis program  
LANGLEY-11888 876-10239 06  
NASA technology utilization house  
LANGLEY-12134 876-10570 07  
Economical solar-heating for homes  
LANGLEY-12135 876-10571 07

**HEAT TRANSFER**

- Handbook of liquid metals  
M-FS-23355 876-10072 04  
Self-contained constant-temperature heat absorber  
M-FS-22989 876-10091 06  
MINIVER Miniature version of real/ideal gas aero-heating and ablation computer program  
M-FS-21951 876-10105 06  
Efficient low static-volume water heater  
M-FS-22469 876-10116 07  
Temperature rise of installed FCC  
M-FS-23127 876-10153 01  
'Thermal-diode' heat pipe  
ARC-10997 876-10223 06

- Heat pipe technology  
HQN-10901 876-10233 06  
Transient thermal analysis of fluid systems  
MSC-19502 876-10401 06  
Multidimensional heat conduction  
MSC-16159 876-10509 03  
One-wire thermocouple  
MSC-16220 876-10556 06  
Thermal-radiation model  
M-FS-23538 876-10562 06
- HEAT TRANSFER COEFFICIENTS**  
Heat-transfer coefficients of pin-finned cylinders  
LEWIS-12557 876-10554 06
- HEAT TRANSMISSION**  
Thermal network modeling handbook  
MSC-14964 876-10236 06
- HEAT TREATMENT**  
Reduction of acoustic losses by outgassing  
MSC-15985 876-10069 04  
Low-voltage motor heater  
KSC-10651 876-10304 01  
Forming hard aluminum in complex shapes  
MSC-19693 876-10579 08  
Electric heating for metal surface hardening  
M-FS-19268 876-10580 08
- HEATING**  
Efficient low static-volume water heater  
M-FS-22469 876-10116 07
- HEATING EQUIPMENT**  
ESOP Version IV Energy systems optimization program  
MSC-14854 876-10106 06  
SESOP Program for solar-energy heating-systems analysis  
MSC-14853 876-10113 06  
Efficient low static-volume water heater  
M-FS-22469 876-10116 07  
Improved high-temperature heater with stabilized-zirconia elements  
M-FS-23351 876-10221 06  
Heat pipe technology  
HQN-10901 876-10233 06  
Low-voltage motor heater  
KSC-10651 876-10304 01  
External heater for cryogenic vessels  
MSC-14056 876-10337 03  
NASA technology utilization house  
LANGLEY-12134 876-10570 07  
Economical solar-heating for homes  
LANGLEY-12135 876-10571 07
- HEAVING**  
Air-cushion landing systems  
LANGLEY-11783 876-10397 06
- HELICAL WINDINGS**  
Zero-angle helical coil  
GSFC-10969 876-10085 06
- HELIUM-NEON LASERS**  
Laser extensometer  
M-FS-19259 876-10030 03  
Laser particulate spectrometer  
MSC-14969 876-10331 03
- HERMETIC SEALS**  
Explosive-seam welding seals large pressure vessels  
LANGLEY-12132 876-10588 08
- HIGH ALTITUDE PRESSURE**  
Low-pressure-gas sampling pump  
ARC-10941 876-10573 07
- HIGH PRESSURE**  
Hydrostatic lift-off seal  
M-FS-21496 876-10079 06
- HIGH RESOLUTION**  
High-resolution electron microscope  
NPO-13811 876-10499 03
- HIGH TEMPERATURE GASES**  
Borosilicate glass-to-Kovar tube bonding  
GSFC-12077 876-10278 08
- HIGH TEMPERATURE TESTS**  
Thermal insulation for high-temperature systems  
GSFC-10954 876-10064 04  
High-temperature heating array  
MSC-14287 876-10251 07
- HINGES**  
Multiposition rescue litter  
MSC-16148 876-10368 05
- HOLDERS**  
Multiposition rescue litter  
MSC-16148 876-10368 05  
Door latch with through-access hole  
MSC-19634 876-10414 07  
Controlled linear clasper/loader  
GSFC-12105 876-10432 08  
Vacuum holddown fixture  
MSC-19666 876-10589 08
- HOLOGRAMMETRY**  
Dual-purpose holocamera  
LEWIS-12166 876-10505 03
- HOLOGRAPHY**  
Holography with surface plasma waves  
M-FS-22040 876-10039 03  
Permanent holographic storage medium  
M-FS-22588 876-10044 03  
Electrode structure for uniform corona discharge  
M-FS-22617 876-10045 03  
Double-exposure holographic interferometer  
NPO-13796 876-10169 03  
Photorefractive page composer  
M-FS-23419 876-10171 03  
Field distribution in a thin lens  
LANGLEY-11392 876-10179 03  
Optics and lasers  
HQN-10893 876-10187 03  
Optical devices  
HQN-10891 876-10188 03  
Hologram-reconstruction signal enhancement  
M-FS-23104 876-10343 03  
Dual-purpose holocamera  
LEWIS-12166 876-10505 03
- HOMODYNE RECEPTION**  
Wind velocity measurement  
M-FS-23362 876-10172 03
- HONEYCOMB STRUCTURES**  
3-D foam adhesive deposition  
M-FS-22739 876-10271 08  
Improved bonding of honeycomb panels  
MSC-19560 876-10428 08
- HOOKS**  
Load-regulating latch  
MSC-19535 876-10252 07
- HORN ANTENNAS**  
Free-space microwave-power transmission  
M-FS-23443 876-10162 02  
Multifrequency broadband dual-polarized antenna  
NPO-13866 876-10464 01
- HORNS**  
Inexpensive low-voltage solid-state alarm  
LEWIS-12544 876-10320 02
- HOT WORKING**  
Reducing cold flow in elastomeric O-rings  
M-FS-24336 876-10086 06
- HOT-WIRE ANEMOMETERS**  
Hot-wire probe  
ARC-10900 876-10222 06  
All-nickel hot-wire probe  
ARC-10911 876-10379 06
- HUMAN FACTORS ENGINEERING**  
Proton tissue dose  
LANGLEY-11802 876-10078 05  
Video simulator with electronic ranging  
MSC-14965 876-10474 02
- HUMAN PATHOLOGY**  
Short-range biotelemetry system  
MSC-16011 876-10369 05
- HUMIDITY**  
Automatic fire/weather data station  
ARC-10993 876-10160 02  
Relative humidity from psychrometric data  
FRC-10108 876-10285 09
- HUMIDITY MEASUREMENT**  
Quartz-crystal-oscillator hygrometer  
GSFC-12153 876-10349 03
- HYBRID CIRCUITS**  
Hybrid-mode thermionic converter  
HQN-10876 876-10056 03  
Guidelines for multiple LSI packaging  
M-FS-23367 876-10159 01  
Foldback current-limiting for hybrid regulator  
M-FS-22995 876-10301 01  
Hybrid thin-film amplifier  
MSC-13975 876-10314 01  
Thick-film preamplifier  
NPO-13416 876-10459 01
- HYDRAULIC CONTROL**  
Fail-safe hydraulic shaker protection  
NPO-13726 876-10218 06
- HYDRAULIC EQUIPMENT**  
Constant-rate fluid-delivery system  
MSC-14905 876-10214 06  
Fail-safe hydraulic shaker protection  
NPO-13726 876-10218 06  
Fluid handling equipment  
HQN-10890 876-10232 06  
Split-ring seal  
MSC-14304 876-10247 07  
Atmosphere-generating system  
MSC-14713 876-10389 06  
Transient thermal analysis of fluid systems  
MSC-19502 876-10401 06  
Powered wheel for aircraft  
LANGLEY-12053 876-10411 07  
Long-life ball-valve design  
M-FS-19282 876-10576 07
- HYDRAZINES**  
Atmosphere-generating system  
MSC-14713 876-10389 06  
Determining total carbon in hydrazine  
KSC-11022 876-10521 04  
Stress-corrosion cracking due to hydrazine  
ARC-11093 876-10526 04
- HYDROCARBON FUELS**  
Surfactant-assisted coal liquefaction  
NPO-13904 876-10517 04
- HYDROCHLORIC ACID**  
Continuous HCl in air indicator  
NPO-13474 876-10060 04  
Hydrogen chloride test set  
M-FS-23357 876-10063 04



**HYDRODYNAMICS**

- Cavitating performance of pumping machinery  
LEWIS-12423 876-10394 06  
Hydrodynamic lubrication of face seals  
LEWIS-12710 876-10558 06

**HYDROFOILS**

- Cavitating performance of pumping machinery  
LEWIS-12423 876-10394 06  
Hydrofoil controls outfall effluents in rivers and oceans  
LANGLEY-12045 876-10488 03

**HYDROGEN**

- Atmosphere-generating system  
MSC-14713 876-10389 06

**HYDROGEN FUELS**

- Hydrogen Energy A bibliography with abstracts  
HQN-10898 876-10189 03

**HYDROGEN-BASED ENERGY**

- Hydrogen Energy A bibliography with abstracts  
HQN-10898 876-10189 03

**HYDROGENATION**

- Surfactant-assisted coal liquefaction  
NPO-13904 876-10517 04

**HYDROMECHANICS**

- Fluid handling equipment  
HQN-10890 876-10232 06  
Hydrofoil controls outfall effluents in rivers and oceans  
LANGLEY-12045 876-10488 03

**HYDROSTATIC PRESSURE**

- Hydrostatic lift-off seal  
M-FS-21496 876-10079 06

**HYDROSTATICS**

- Hydrodynamic lubrication of face seals  
LEWIS-12710 876-10558 06

**HYGROMETERS**

- Quartz-crystal-oscillator hygrometer  
GSFC-12153 876-10349 03  
Remote moisture-content balance  
ARC-11032 876-10492 03

**HYPERSONIC BOUNDARY LAYER**

- Hot-wire probe  
ARC-10900 876-10222 06

**HYPERSONIC FLOW**

- Analytic numerical solutions for shock waves  
ARC-10959 876-10096 06  
Shock interference patterns and heating  
LANGLEY-11497 876-10240 06

**ICE FORMATION**

- All-weather ice information system  
LEWIS-12638 876-10018 02

**ICE MAPPING**

- All-weather ice information system  
LEWIS-12638 876-10018 02

**ICEBERGS**

- All-weather ice information system  
LEWIS-12638 876-10018 02

**IDENTIFYING**

- Inexpensive tags for tubes or cables  
LEWIS-12676 876-10584 08

**IGNITION SYSTEMS**

- Sustained-arc ignition system  
LEWIS-12444 876-10410 07  
Electrostatic-discharge ignition  
NPO-13798 876-10487 03

**ILLUMINATION**

- Analog-to-binary conversion of video data  
GSFC-11918 876-10165 02

**IMAGE CONTRAST**

- Contrast enhancement of transparencies  
GSFC-11989 876-10181 03

**IMAGE CONVERTERS**

- X-ray sensitive oblique imaging device  
GSFC-11935 876-10504 03

**IMAGE DISSECTOR TUBES**

- Anamorphic lens for tracking system  
NPO-13062 876-10046 03  
Calibration of image dissector tubes  
M-FS-22208 876-10055 03

**IMAGE ENHANCEMENT**

- Selective image enhancement  
M-FS-23364 876-10021 02  
Interactive imaging and data processing  
NPO-13655 876-10167 02  
Contrast enhancement of transparencies  
GSFC-11989 876-10181 03  
Image intensification of developed photographs  
M-FS-23461 876-10495 03  
High-resolution electron microscope  
NPO-13811 876-10499 03  
Magnifying image intensifier  
GSFC-12010 876-10506 03  
Multispectral-scanner image processing  
GSFC-12135 876-10508 03

**IMAGE INTENSIFIERS**

- Improved collimator for imaging system  
M-FS-22863 876-10038 03  
Vidicon intensifier  
NPO-11912 876-10054 03  
Calibration of image dissector tubes  
M-FS-22208 876-10055 03  
Deflection amplifier for image dissectors  
NPO-13079 876-10449 01  
X-ray sensitive oblique imaging device  
GSFC-11935 876-10504 03  
Magnifying image intensifier  
GSFC-12010 876-10506 03  
Multispectral-scanner image processing  
GSFC-12135 876-10508 03  
Digital image-rectification system  
GSFC-12156 876-10513 03

**IMAGE ORTHICONS**

- Calibration of image dissector tubes  
M-FS-22208 876-10055 03

**IMAGING TECHNIQUES**

- Color to black-and-white converter  
MSC-12618 876-10346 03  
Improved resolution for sensor arrays  
NPO-13745 876-10439 01  
Advanced imaging communication system  
NPO-13545 876-10482 02  
High-resolution electron microscope  
NPO-13811 876-10499 03  
X-ray sensitive oblique imaging device  
GSFC-11935 876-10504 03  
Dual-purpose holocamera  
LEWIS-12166 876-10505 03  
Multispectral-scanner image processing  
GSFC-12135 876-10508 03  
Multispectral imaging for medical diagnosis  
NPO-13922 876-10540 05

- Document restoration by computer techniques  
HQN-10910 876-10597 09  
CAMSP Classification and Mensuration Software Package  
MSC-14979 876-10600 09

**IMPACT LOADS**

- Low-onset-rate energy absorber  
MSC-12279 876-10385 06

**IMPACT PREDICTION**

- Impact response analyses  
M-FS-23335 876-10559 06  
Impact of a solid body with water  
M-FS-23512 876-10560 06

**IMPEDANCE MATCHING**

- Pulse transformer for GaAs laser  
M-FS-23399 876-10185 03

**IMPEDANCE MEASUREMENTS**

- Time-domain reflectometry for cable-fault isolation  
KSC-10741 876-10377 06

**IMPELLERS**

- Spin-rate control device  
ARC-10884 876-10417 07

**IMPURITIES**

- Determining total carbon in hydrazine  
KSC-11022 876-10521 04  
Detecting contamination on a metal surface  
M-FS-19260 876-10552 06

**INCIDENT RADIATION**

- Two-dimensional photon detector  
M-FS-23325 876-10048 03

**INCOMPRESSIBLE FLOW**

- Swept wing aerodynamics  
ARC-10790 876-10403 06

**INDEXES (DOCUMENTATION)**

- Library information retrieval system  
NPO-14017 876-10599 09

**INDICATING INSTRUMENTS**

- Pressure tube instrumentation  
LEWIS-12539 876-10101 06  
Radial level  
LANGLEY-11982 876-10246 07  
AC adapter for fuel-flow sensor  
GSFC-12037 876-10387 06

**INDUCTANCE**

- Direct-reading inductance meter  
NPO-13792 876-10473 02

**INDUCTION MOTORS**

- Low-voltage motor heater  
KSC-10651 876-10304 01  
Induction motor analysis  
LEWIS-12687 876-10484 02

**INDUCTORS**

- RF shaping of silicon ribbon  
M-FS-23424 876-10258 08  
Composite stacked moly-permalloy cores  
NPO-13578 876-10294 01  
Simplified cut-core inductor  
NPO-13600 876-10317 01

**INDUSTRIAL ENERGY**

- Hydrogen Energy A bibliography with abstracts  
HQN-10898 876-10189 03

**INDUSTRIAL MANAGEMENT**

- Learning/cost-improvement curves  
M-FS-23429 876-10287 09

**INDUSTRIAL WASTES**

- Atmospheric particle sampler  
NPO-13396 876-10059 04  
Catalytic oxidation of waste materials  
MSC-14831 876-10354 04  
Hydrofoil controls outfall effluents in rivers and oceans  
LANGLEY-12045 876-10488 03

**INFORMATION**

- Data-management and information system  
NPO-13716 B76-10602 09
- Code-usage analysis system  
MSC-16214 B76-10603 09

**INFORMATION RETRIEVAL**

- Readout method for stored information  
NPO-13243 B76-10029 02
- Recording-tape position sensor  
GSFC-12056 B76-10577 07
- Document restoration by computer techniques  
HQN-10910 B76-10597 09
- Library information retrieval system  
NPO-14017 B76-10599 09
- Information retrieval and display system  
M-FS-23510 B76-10606 09

**INFORMATION SYSTEMS**

- Photorefractive page composer  
M-FS-23419 B76-10171 03

**INFORMATION THEORY**

- Long binary frame sync words  
NPO-13727 B76-10163 02
- Concatenated algebraic decoder  
MSC-14058 B76-10325 02
- Interleaved cyclic codes  
KSC-11040 B76-10435 09

**INFRARED DETECTORS**

- Pyroionic infrared detector  
LANGLEY-11921 B76-10204 04

**INFRARED IMAGERY**

- Beam patterns of light-emitting diodes  
GSFC-11890 B76-10040 03

**INFRARED LASERS**

- Beam patterns of light-emitting diodes  
GSFC-11890 B76-10040 03

**INFRARED PHOTOGRAPHY**

- Liquid-cooled bra for cancer detection  
ARC-11007 B76-10533 05
- Multispectral imaging for medical diagnosis  
NPO-13922 B76-10540 05

**INFRARED SCANNERS**

- Synchronized backside-weld follower  
M-FS-24454 B76-10272 08

**INFRARED SPECTROMETERS**

- Miniature carbon dioxide sensor  
MSC-16009 B76-10344 03
- Portable solar radiometer measures stack-plume effluents  
LANGLEY-12123 B76-10491 03

**INFRARED SPECTROSCOPY**

- Tunable acoustical optical filter  
NPO-13640 B76-10340 03

**INJECTION**

- Propellant side feed  
LANGLEY-11082 B76-10094 06

**INLET FLOW**

- Design analysis of radial-inflow turbines  
LEWIS-12684 B76-10561 06

**INLET NOZZLES**

- Borosilicate glass-to-Kovar tube bonding  
GSFC-12077 B76-10278 08

**INORGANIC CHEMISTRY**

- Growing crystals from eutectic melts  
M-FS-22926 B76-10202 04
- Annealing strained alloy 718  
M-FS-19242 B76-10284 08

**INSPECTION**

- Computer-automated ultrasonic inspection system  
M-FS-23338 B76-10217 06
- Simplified explosive-weld evaluation  
MSC-14654 B76-10228 06

Graphical methods for variable sampling plans

- MSC-19279 B76-10431 08
- Ultrasonic monitoring of crack extension  
LEWIS-12632 B76-10547 06

**INSTALLATION MANUALS**

- Installation of surface-mounted flat-conductor cable  
M-FS-23266 B76-10158 01

**INSTALLING**

- Pressure tube instrumentation  
LEWIS-12539 B76-10101 06

**INSTRUMENT LANDING SYSTEMS**

- Multiplane binocular visual display system  
ARC-10808 B76-10168 02

**INSTRUMENT ORIENTATION**

- Optical alignment system  
ARC-10932 B76-10178 03

**INSTRUMENT TRANSMITTERS**

- A/D converter  
LANGLEY-11319 B76-10009 01
- Disposable biomedical electrode  
MSC-14623 B76-10363 05
- Miniature-angular-position transducer  
LANGLEY-11999 B76-10555 06

**INSULATED STRUCTURES**

- Thermal/acoustical insulation foam  
MSC-14795 B76-10195 04

**INSULATION**

- Thermal insulation for high-temperature systems  
GSFC-10954 B76-10064 04
- Solar thermal energy utilization A bibliography with abstracts  
HQN-10900 B76-10186 03
- Thermal/acoustical insulation foam  
MSC-14795 B76-10195 04
- Improved insulation material  
MSC-14642 B76-10197 04

**INTEGRAL EQUATIONS**

- Integral-matrix procedure for boundary-layer problems  
M-FS-23348 B76-10608 09

**INTEGRATED CIRCUITS**

- DIP extractor simplifies circuit removal  
MSC-12712 B76-10002 01
- Mask analysis program  
M-FS-23431 B76-10318 01
- Open-loop digital frequency multiplier  
MSC-12709 B76-10447 01
- Parylene coating for circuit components  
M-FS-23450 B76-10583 08
- Elimination of thermally generated EMF's on PC boards  
MSC-16125 B76-10594 08

**INTEGRATORS**

- A/D converter  
LANGLEY-11319 B76-10009 01

**INTENSIFIERS**

- Calibration of image dissector tubes  
M-FS-22208 B76-10055 03

**INTERFACES**

- CMOS-compatible tristate cable driver  
M-FS-23410 B76-10149 01

**INTERFEROMETERS**

- Stepping optical path difference in an interferometer  
NPO-13569 B76-10033 03
- Improved interferometer beam splitter  
NPO-11932 B76-10041 03
- Measuring scatter angle from mirrors  
M-FS-23421 B76-10342 03

**INTERFEROMETRY**

- Dual-purpose holocamera  
LEWIS-12166 B76-10505 03

**INTERNAL COMBUSTION ENGINES**

- Improved automobile gas turbine engine  
LEWIS-12521 B76-10115 07
- Sustained-arc ignition system  
LEWIS-12444 B76-10410 07
- Electrostatic-discharge ignition  
NPO-13798 B76-10487 03
- Indicated mean-effective pressure instrument  
LEWIS-12661 B76-10542 06

**INTERNATIONAL SYSTEM OF UNITS**

- Astronautic structures manual  
M-FS-23547 B76-10393 06

**INTERPOLATION**

- Curvilinear bicubic-spline-fit interpolation  
LANGLEY-11391 B76-10434 09
- Contouring randomly spaced data  
LANGLEY-12044 B76-10436 09
- Improved resolution for sensor arrays  
NPO-13745 B76-10439 01

**INTERROGATION**

- Low-cost pressure-data encoder  
NPO-13692 B76-10303 01

**INVENTORY MANAGEMENT**

- Estimation of spares  
MSC-19469 B76-10133 09

**INVERTERS**

- A nonsaturating dc-to-dc parallel power converter  
GSFC-12047 B76-10290 01
- Fluorescent dimming ballast  
MSC-14937 B76-10292 01

**INVISCID FLOW**

- Analytic numerical solutions for shock waves  
ARC-10959 B76-10096 06
- Shock interference patterns and heating  
LANGLEY-11497 B76-10240 06
- Swept wing aerodynamics  
ARC-10790 B76-10403 06

**ION BEAMS**

- Double-focusing mass spectrometer  
NPO-13663 B76-10183 03

**ION EXCHANGE MEMBRANE ELECTROLYTES**

- REDOX - electrochemical energy storage  
LEWIS-12220 B76-10070 04

**ION EXCHANGING**

- Extraction of urea and ammonium ion  
ARC-11064 B76-10515 04

**ION IMPLANTATION**

- IGFET/SOI fabrication method  
M-FS-23312 B76-10259 08

**ION INJECTION**

- Fabrication and applications of electrets  
M-FS-23437 B76-10429 08

**ION PUMPS**

- Double-focusing mass spectrometer  
NPO-13663 B76-10183 03

**ION SELECTIVE ELECTRODES**

- Specific-ion electrodes for measuring Ag ions  
MSC-14906 B76-10068 04

**IONIZATION**

- Pyroionic infrared detector  
LANGLEY-11921 B76-10204 04

**ISOLATORS**

- Low-onset-rate energy absorber  
MSC-12279 B76-10385 06

**ISOTHERMAL PROCESSES**

- Improved high-temperature heater with stabilized-zirconia elements  
M-FS-23351 B76-10221 06

## ITERATIVE NETWORKS

Control logic for successive-approximation A/D converters  
NPO-11937 B76-10010 01  
Inductorless voltage multiplier/converter  
NPO-13757 B76-10445 01

## J

## J-85 ENGINE

Jet engine stator-blade removal tool  
MSC-16000 B76-10420 07

## JACKETS

Electrical-cable design guide  
M-FS-24280 B76-10157 01

## JET AIRCRAFT NOISE

Noise suppressor for turbofan-jet engines  
ARC-10812 B76-10375 06

## JET ENGINES

Noise suppressor for turbofan-jet engines  
ARC-10812 B76-10375 06

## JET EXHAUST

Swept-tapered-wing aerodynamics  
LANGLEY-11701 B76-10112 06

## JET THRUST

Propellant side feed  
LANGLEY-11082 B76-10094 06

## JIGS

Precision centering vise  
KSC-11041 B76-10409 07  
Controlled linear clasper/loader  
GSFC-12105 B76-10432 08  
Vacuum holddown fixture  
MSC-19666 B76-10589 08

## JOINTS (JUNCTIONS)

Analysis of bonded joints  
LANGLEY-11871 B76-10231 06  
Flexible fitting for fluid lines  
MSC-17780 B76-10277 08  
Technique for joining metal tubing  
ARC-10946 B76-10279 08  
Astronautic structures manual  
M-FS-23547 B76-10393 06  
Improved bonding of honeycomb panels  
MSC-19560 B76-10428 08

## JOSEPHSON JUNCTIONS

Improved microbridge Josephson devices  
M-FS-23274 B76-10012 01

## JOULE-THOMSON EFFECT

Joule-Thomson data curves  
KSC-10538 B76-10102 06

## JUMPERS

Multiple-layer printed-wiring trace connector  
LANGLEY-11709 B76-10305 01

## JUNCTION DIODES

Semiconductor ohmic contact  
LANGLEY-11691 B76-10461 01

## K

## KINEMATIC EQUATIONS

Impact response analyses  
M-FS-23335 B76-10559 06

## KINESTHESIA

Measuring mandibular motions  
ARC-10956 B76-10362 05  
In vivo bone-strain telemetry  
ARC-11074 B76-10535 05

## KIRCHHOFF LAW OF RADIATION

Thermal network modeling handbook  
MSC-14964 B76-10236 06

## KOVAR (TRADEMARK)

Solar cell electrical connections  
LEWIS-12293 B76-10260 08  
Borosilicate glass-to-Kovar tube bonding  
GSFC-12077 B76-10278 08

## L

## LABORATORY EQUIPMENT

Leak testing glass ampoules  
LANGLEY-11988 B76-10551 06

## LAGEOS (SATELLITE)

Thermal/vacuum testing of laser corner-cube retroreflectors  
M-FS-23565 B76-10549 06

## LAGRANGE MULTIPLIERS

Impact response analyses  
M-FS-23335 B76-10559 06  
Trimmed noncoplanar planforms with minimum vortex drag  
LANGLEY-12121 B76-10566 06

## LAMINAR BOUNDARY LAYER

Shock interference patterns and heating  
LANGLEY-11497 B76-10240 06  
Integral-matrix procedure for boundary-layer problems  
M-FS-23348 B76-10608 09

## LAMINAR FLOW

Transient thermal analysis of fluid systems  
MSC-19502 B76-10401 06

## LAMINATES

Thermal insulation for high-temperature systems  
GSFC-10954 B76-10064 04  
BUCLAP2  
LANGLEY-11696 B76-10111 06  
Manufacture of flat-conductor cable  
M-FS-23121 B76-10155 01  
Composite laminate warpage  
LEWIS-12615 B76-10355 04  
Flexible-pile thermal sealant  
MSC-19568 B76-10371 06  
Low-pressure low-temperature molding process  
MSC-19778 B76-10425 08

## LANDING AIDS

Multiplane binocular visual display system  
ARC-10808 B76-10168 02

## LANDING GEAR

Crosswind landing-gear position indicator  
LANGLEY-11941 B76-10120 07

## LANDING INSTRUMENTS

Crosswind landing-gear position indicator  
LANGLEY-11941 B76-10120 07

## LANDING LOADS

Impact of a solid body with water  
M-FS-23512 B76-10560 06

## LANDING SIMULATION

Full-color hybrid display  
ARC-10903 B76-10477 02

## LANDSAT SATELLITES

DAM - detection and mapping  
MSC-16096 B76-10370 05

## LAPLACE EQUATION

Systems improved numerical differencing analyzer  
MSC-13805 B76-10609 09

## LARGE SCALE INTEGRATION

Economical custom LSI arrays  
M-FS-23262 B76-10004 01  
Guidelines for multiple LSI packaging  
M-FS-23367 B76-10159 01

## LASER CAVITIES

Pulse transformer for GaAs laser  
M-FS-23399 B76-10185 03

## LASER MODES

Stabilized Nd YAG laser output  
GSFC-11571 B76-10335 03

## LASER OUTPUTS

Beam patterns of light-emitting diodes  
GSFC-11890 B76-10040 03

Dual-purpose holocamera  
LEWIS-12166 B76-10505 03

## LASER PLASMAS

Efficient copper-vapor pulsed laser  
NPO-13449 B76-10341 03

## LASER RANGE FINDERS

Pointing control/roll positioning mechanism  
M-FS-22809 B76-10121 07

## LASERS

Double-exposure holographic interferometer  
NPO-13796 B76-10169 03  
Photorefractive page composer  
M-FS-23419 B76-10171 03  
Wind velocity measurement  
M-FS-23362 B76-10172 03  
Combined GaAs laser outputs  
M-FS-23397 B76-10173 03  
Airport laser-Doppler  
M-FS-23423 B76-10174 03  
Low-threshold light-emitting-diode laser  
LANGLEY-11477 B76-10176 03  
Simplified deflection-coil linearity testing  
M-FS-23400 B76-10180 03  
Contrast enhancement of transparencies  
GSFC-11989 B76-10181 03  
Optics and lasers  
HQN-10893 B76-10187 03  
Optical devices  
HQN-10891 B76-10188 03  
Bit-error rates in optical communications  
M-FS-23340 B76-10286 09

## LATCHES

Load-regulating latch  
MSC-19535 B76-10252 07  
Door latch with through-access hole  
MSC-19634 B76-10414 07

## LATERAL CONTROL

Pointing control/roll positioning mechanism  
M-FS-22809 B76-10121 07

Omnidirectional wheel  
M-FS-21309 B76-10575 07

## LATITUDE

Geodetic control net  
NPO-13718 B76-10510 03

## LATTICE PARAMETERS

Faster X-ray analysis of semiconductor wafers  
M-FS-23315 B76-10225 06  
Crystal orientation for solid-state photolithography  
LANGLEY-11940 B76-10582 08

## LAW (JURISPRUDENCE)

Thermoluminescence for forensic analysis  
NPO-11607 B76-10192 04

## LEAD COMPOUNDS

Nucleation of electronic-crystal regions  
B76-10524 04

**LEAKAGE**

- Inexpensive leak-detector envelope  
LEWIS-11305 B76-10084 06  
Stopping small liquid leaks  
KSC-10667 B76-10126 08  
Leak testing glass ampoules  
LANGLEY-11988 B76-10551 06

**LEARNING CURVES**

- Learning/cost-improvement curves  
M-FS-23429 B76-10287 09

**LEAST SQUARES METHOD**

- Development ephemeris number 96  
NPO-14002 B76-10507 03  
Estimating aircraft states  
ARC-10969 B76-10567 06

**LEG (ANATOMY)**

- In vivo bone-strain telemetry  
ARC-11074 B76-10535 05  
An artificial leg for hip disarticulation  
ARC-10916 B76-10541 05

**LENS DESIGN**

- Anamorphic lens for tracking system  
NPO-13062 B76-10046 03  
Analysis of laser heterodyne communications  
GSFC-12098 B76-10511 03

**LENSES**

- Improved Einzel lenses  
M-FS-23115 B76-10032 03  
CONVERT Technique and computer program for calculating photographic film-density variations  
LANGLEY-11873 B76-10057 03  
Field distribution in a thin lens  
LANGLEY-11392 B76-10179 03  
Antireflection coating for plastic lenses  
ARC-10983 B76-10591 08

**LEVELING**

- Leveling apparatus for precision instruments  
ARC-10981 B76-10572 07

**LIAPUNOV FUNCTIONS**

- Linear stochastic optimal control and estimation  
LEWIS-12505 B76-10134 09  
Linear stochastic optimal control and estimation  
LEWIS-12540 B76-10607 09

**LIBRARIES**

- Library information retrieval system  
NPO-14017 B76-10599 09

**LIFE SPAN**

- Birth/death process model  
NPO-13616 B76-10213 05

**LIFE SUPPORT SYSTEMS**

- Atmosphere-generating system  
MSC-14713 B76-10389 06  
Extraction of urea and ammonium ion  
ARC-11064 B76-10515 04  
Caution and warning system  
MSC-16046 B76-10531 05

**LIFT**

- Estimating subsonic aerodynamic characteristics of complex planforms  
LANGLEY-11047 B76-10565 06

**LIGHT AMPLIFIERS**

- Charge-sensitive amplifier with notched frequency response  
LANGLEY-11317 B76-10440 01

**LIGHT BEAMS**

- Optical bias assembly  
MSC-14412 B76-10051 03  
Beam splitter/combiner  
GSFC-12083 B76-10177 03

**LIGHT EMISSION**

- Optical devices  
HQN-10891 B76-10188 03

- Thermoluminescence for forensic analysis  
NPO-11607 B76-10192 04

**LIGHT EMITTING DIODES**

- Electro-optical liquid depth sensor  
M-FS-22921 B76-10024 02  
Light pipes for LED measurements  
GSFC-11887 B76-10034 03  
Calibration source for sensitive optical detectors  
LANGLEY-11625 B76-10036 03  
Beam patterns of light-emitting diodes  
GSFC-11890 B76-10040 03  
Determination of radiative current in LEDs  
GSFC-12034 B76-10042 03  
Calibration of image dissector tubes  
M-FS-22208 B76-10055 03  
Low-threshold light-emitting-diode laser  
LANGLEY-11477 B76-10176 03  
Epitaxial growth of Ga<sub>1-x</sub>Al<sub>x</sub>As on GaP  
GSFC-11826 B76-10261 08  
Solid-state turn-coordinator display  
LANGLEY-12090 B76-10451 01

**LIGHT SCATTERING**

- Economical measurement of particle concentration  
GSFC-12088 B76-10332 03  
Measuring scatter angle from mirrors  
M-FS-23421 B76-10342 03

**LIGHT SOURCES**

- Calibration source for sensitive optical detectors  
LANGLEY-11625 B76-10036 03

**LIGHTING EQUIPMENT**

- Fluorescent-lamp power supply  
MSC-14900 B76-10140 01

**LIGHTNING**

- WING Calculating lightning-induced voltages in electrical circuits within an aircraft wing  
LEWIS-12108 B76-10351 03

**LIGNIN**

- Extracting lignins from mill wastes  
NPO-13847 B76-10514 04

**LIMITER CIRCUITS**

- Foldback current-limiting for hybrid regulator  
M-FS-22995 B76-10301 01  
Low-frequency sine wave hard-limiting technique  
NPO-13230 B76-10309 01  
Capacitively-coupled data receiver clipper stage  
MSC-14989 B76-10456 01  
Active inrush-current limiter  
GSFC-11789 B76-10467 01

**LINE SPECTRA**

- Shadow mask for X-ray spectrometer  
GSFC-12131 B76-10348 03

**LINEAR CIRCUITS**

- Modular design of high frequency circuits  
M-FS-23408 B76-10139 01  
Deflection amplifier for image dissectors  
NPO-13079 B76-10449 01

**LINEAR INTEGRATED CIRCUITS**

- Hybrid thin-film amplifier  
MSC-13975 B76-10314 01

**LIQUEFIED NATURAL GAS**

- Vapor/liquid interface sensor  
MSC-12474 B76-10220 06  
Cryogenic storage tank thermal analysis  
MSC-19103 B76-10234 06  
Safety organizations and experts  
LEWIS-12742 B76-10598 09

**LIQUID BEARINGS**

- Fluid-film bearing damper  
LEWIS-11158 B76-10378 06

**LIQUID INJECTION**

- Constant-rate fluid-delivery system  
MSC-14905 B76-10214 06

**LIQUID LEVELS**

- Electro-optical liquid depth sensor  
M-FS-22921 B76-10024 02

**LIQUID METALS**

- Handbook of liquid metals  
M-FS-23355 B76-10072 04

**LIQUID SLOSHING**

- Liquid-retention canopy  
M-FS-24133 B76-10092 06

**LIQUID-SOLID INTERFACES**

- Electro-optical liquid depth sensor  
M-FS-22921 B76-10024 02

**LIQUIDS**

- Stopping small liquid leaks  
KSC-10667 B76-10126 08

**LITHIUM NIOBATES**

- Nucleation of electronic-crystal regions  
M-FS-23049 B76-10524 04

**LOAD DISTRIBUTION (FORCES)**

- Load-regulating latch  
MSC-19535 B76-10252 07  
Dynamic load attenuator  
MSC-17472 B76-10416 07

**LOAD TESTS**

- Ultrasonic monitoring of crack extension  
LEWIS-12632 B76-10547 06

**LOADING MOMENTS**

- Cable-load equalization system  
MSC-17494 B76-10230 06  
Vehicle load-equalization system  
MSC-12466 B76-10249 07

**LOADING OPERATIONS**

- Improved road handler  
M-FS-23233 B76-10413 07

**LOADING RATE**

- Dynamic load attenuator  
MSC-17472 B76-10416 07

**LOADS (FORCES)**

- Accelerator for biomedical studies  
ARC-10898 B76-10367 05  
Improved road handler  
M-FS-23233 B76-10413 07  
Energy-absorbing attenuator  
MSC-17473 B76-10419 07  
Mechanical loader for testing composites  
LEWIS-12432 B76-10548 06  
Transpose of finite-element data  
MSC-19644 B76-10564 06

**LOCKS**

- Door latch with through-access hole  
MSC-19634 B76-10414 07

**LOGIC CIRCUITS**

- Control logic for successive-approximation A/D converters  
NPO-11937 B76-10010 01  
M-ary shift register  
NPO-11868 B76-10011 01  
Pulse amplitude discriminator threshold calibration  
GSFC-11912 B76-10023 02

**LOGISTICS MANAGEMENT**

- DORCA II Dynamic operations requirements and cost analysis program  
HQN-10834 B76-10289 09

**LONGITUDE**

- Geodetic control net  
NPO-13718 B76-10510 03

**LONGITUDINAL CONTROL**

- Pointing control/roll positioning  
mechanism  
M-FS-22809 876-10121 07
- LOW ALTITUDE**  
Gust alleviation for STOL aircraft  
LANGLEY-11413 876-10099 06
- LOW DENSITY MATERIALS**  
Polymeric foams stable at high  
temperatures  
ARC-11008 876-10065 04  
Thermal/acoustical insulation foam  
MSC-14795 876-10195 04
- LOW PASS FILTERS**  
Pinhole diffraction filter  
GSFC-12120 876-10333 03
- LOW PRESSURE**  
Low-pressure-gas sampling pump  
ARC-10941 876-10573 07
- LOW TEMPERATURE TESTS**  
Low-temperature thermoluminescence  
NPO-11935 876-10193 04
- LUBRICATION**  
Hydrodynamic lubrication of face seals  
LEWIS-12710 876-10558 06
- LUMINAIRES**  
Fluorescent-lamp power supply  
MSC-14900 876-10140 01  
High-temperature heating array  
MSC-14287 876-10251 07
- LUMINOUS INTENSITY**  
Solid-state turn-coordinator display  
LANGLEY-12090 876-10451 01

**M****MACH NUMBER**

- Joule-Thomson data curves  
KSC-10538 876-10102 06

**MACH-ZEHNDER INTERFEROMETERS**

- Double-exposure holographic  
interferometer  
NPO-13796 876-10169 03

**MACHINE TOOLS**

- Rotary broaches  
M-FS-23374 876-10248 07  
Hand and power tools  
HQN-10892 876-10257 07  
Air-suspended dynamometer table  
NPO-13794 876-10376 06  
Vacuum holddown fixture  
MSC-19666 876-10589 08

**MACHINING**

- Rotary broaches  
M-FS-23374 876-10248 07  
Electron-beam welder alinement  
MSC-19642 876-10269 08  
Machining titanium alloys  
M-FS-23006 876-10283 08

**MAGNETIC CIRCUITS**

- Fluorescent dimming ballast  
MSC-14937 876-10292 01  
A passive chevron replicator  
LANGLEY-11906 876-10441 01

**MAGNETIC COILS**

- RF shaping of silicon ribbon  
M-FS-23424 876-10258 08  
Simplified cut-core inductor  
NPO-13600 876-10317 01  
Magnifying image intensifier  
GSFC-12010 876-10506 03

**MAGNETIC CORES**

- Toroidal converter core  
NPO-13413 876-10293 01

- Transformer design tradeoffs  
NPO-13755 876-10470 01

**MAGNETIC DOMAINS**

- Triple-layer bubble-domain film  
LANGLEY-11755 876-10006 01  
Analog data recording on MnBi film  
NPO-13302 876-10175 03  
A passive chevron replicator  
LANGLEY-11906 876-10441 01  
New passive replicator for bubble domain  
devices  
LANGLEY-11997 876-10442 01  
Continuous-data FIFO bubble shift  
register  
LANGLEY-11862 876-10443 01  
Multiple-bubble detector  
LANGLEY-12043 876-10444 01

**MAGNETIC FORMING**

- RF shaping of silicon ribbon  
M-FS-23424 876-10258 08

**MAGNETIC INDUCTION**

- Nondestructive inspection of multilayered  
insulation  
M-FS-22191 876-10128 08  
Induction motor analysis  
LEWIS-12687 876-10484 02

**MAGNETIC LENSES**

- Magnifying image intensifier  
GSFC-12010 876-10506 03

**MAGNETIC POLES**

- Double-focusing mass spectrometer  
NPO-13663 876-10183 03

**MAGNETIC RECORDING**

- Analog data recording on MnBi film  
NPO-13302 876-10175 03  
Safety brake for tape reels  
GSFC-11960 876-10412 07

**MAGNETIC STORAGE**

- Triple-layer bubble-domain film  
LANGLEY-11755 876-10006 01  
Low-light-level integrating video system  
M-FS-23288 876-10347 03  
A passive chevron replicator  
LANGLEY-11906 876-10441 01  
New passive replicator for bubble domain  
devices  
LANGLEY-11997 876-10442 01  
Continuous-data FIFO bubble shift  
register  
LANGLEY-11862 876-10443 01

**MAGNETOMETERS**

- Cyclical bi-directional rotary actuator  
GSFC-11883 876-10117 07

**MAGNETS**

- Double-focusing mass spectrometer  
NPO-13663 876-10183 03

**MAINTENANCE**

- Plug-in light switches  
M-FS-24183 876-10001 01  
Inexpensive leak-detector envelope  
LEWIS-11305 876-10084 06  
Stopping small liquid leaks  
KSC-10667 876-10126 08  
Frozen-fluid line repair  
MSC-19132 876-10227 06  
Repair of fused silica platens  
MSC-19713 876-10276 08  
Jet engine stator-blade removal tool  
MSC-16000 876-10420 07

**MAN MACHINE SYSTEMS**

- Graphic-to-digital conversion system  
M-FS-24410 876-10019 02  
Interactive imaging and data processing  
NPO-13655 876-10167 02  
Computer-automated ultrasonic  
inspection system  
M-FS-23338 876-10217 06

- Overhead tray for cable test system  
MSC-19488 876-10270 08  
Flexible high-speed instrumentation  
system  
FRC-10110 876-10483 02

**MANAGEMENT INFORMATION SYSTEMS**

- Business capabilities file  
NPO-13834 876-10136 09
- MANAGEMENT SYSTEMS**  
Information retrieval and display system  
M-FS-23510 876-10606 09

**MANDRELS**

- Low-pressure low-temperature molding  
process  
MSC-19778 876-10425 08

**MANIFOLDS**

- Conical diffuser for fuel cells  
MSC-14026 876-10255 07

**MANIPULATORS**

- Selective image enhancement  
M-FS-23364 876-10021 02  
Video display synthesizer  
MSC-14620 876-10052 03  
Concentric-tube differential drive  
M-FS-22707 876-10114 07  
Infrared range sensor  
ARC-10885 876-10475 02

**MANUFACTURING**

- Connector contact-ring bus  
MSC-19480 876-10146 01  
Flat-conductor cable baseboard  
M-FS-23141 876-10154 01  
Manufacture of flat-conductor cable  
M-FS-23121 876-10155 01  
Installation of surface-mounted  
flat-conductor cable  
M-FS-23266 876-10158 01

**MAPPING**

- SANDTRACKS World map and stations  
predictions computer programs  
GSFC-12099 876-10190 03  
DAM - detection and mapping  
MSC-16096 876-10370 05  
Contouring randomly spaced data  
LANGLEY-12044 876-10436 09  
Digital image-rectification system  
GSFC-12156 876-10513 03

**MARINE RESOURCES**

- Remote sensing of natural resources  
HQN-10899 876-10238 06

**MARKING**

- Inexpensive tags for tubes or cables  
LEWIS-12676 876-10584 08

**MARKOV PROCESSES**

- Birth/death process model  
NPO-13616 876-10213 05

**MASKING**

- Mask analysis program  
M-FS-23431 876-10318 01  
Crystal orientation for solid-state  
photolithography  
LANGLEY-11940 876-10582 08

**MASKS**

- Firefighter's breathing system  
MSC-14733 876-10208 05

**MASONRY**

- Hot-wire tile removal tool  
KSC-11043 876-10433 08

**MASS FLOW**

- Indicated mean-effective pressure  
instrument  
LEWIS-12661 876-10542 06

**MASS SPECTROMETERS**

- Inexpensive leak-detector envelope  
LEWIS-11305 876-10084 06

- Double-focusing mass spectrometer  
NPO-13663 876-10183 03  
Borosilicate glass-to-Kovar tube  
bonding  
GSFC-12077 876-10278 08
- MATERIALS HANDLING**  
Aseptic fluid-transfer system  
NPO-13743 876-10210 05  
DORCA II Dynamic operations  
requirements and cost analysis program  
HQN-10834 876-10289 09  
Improved road handler  
M-FS-23233 876-10413 07  
Inexpensive tags for tubes or cables  
LEWIS-12676 876-10584 08
- MATERIALS RECOVERY**  
DIP extractor simplifies circuit removal  
MSC-12712 876-10002 01
- MATERIALS TESTS**  
Comparative thermal fatigue resistance  
LEWIS-12563 876-10062 04  
Computer-automated ultrasonic  
inspection system  
M-FS-23338 876-10217 06  
Faster X-ray analysis of semiconductor  
wafers  
M-FS-23315 876-10225 06
- MATHEMATICAL MODELS**  
Birth/death process model  
NPO-13616 876-10213 05  
Attenuation of sound in ducts with  
acoustic treatment  
LEWIS-12686 876-10226 06  
Design of redundant systems  
MSC-16026 876-10383 06  
Time-domain aircraft model  
MSC-16018 876-10391 06  
SPAR Structural-performance analysis  
and redesign  
LANGLEY-12062 876-10399 06  
Control system design  
LEWIS-12556 876-10404 06  
Oblique orthographic projections and  
contour plots  
LANGLEY-11877 876-10601 09
- MATRICES (MATHEMATICS)**  
Processing equations for state-space  
models  
LEWIS-12555 876-10438 09  
Linear stochastic optimal control and  
estimation  
LEWIS-12540 876-10607 09
- MATRIX METHODS**  
SPAR Structural-performance analysis  
and redesign  
LANGLEY-12062 876-10399 06
- MEASURING INSTRUMENTS**  
Ultraviolet fire detector  
M-FS-21577 876-10016 02  
Light pipes for LED measurements  
GSFC-11887 876-10034 03  
Inexpensive leak-detector envelope  
LEWIS-11305 876-10084 06  
Hot-wire probe  
ARC-10900 876-10222 06  
Radial level  
LANGLEY-11982 876-10246 07  
Signal level detector  
NPO-13272 876-10310 01  
Self-calibrating radiometer  
ARC-10811 876-10339 03  
Air-suspended dynamometer table  
NPO-13794 876-10376 06  
Capacitive shaft-angle encoder  
ARC-10897 876-10386 06  
Direct-reading inductance meter  
NPO-13792 876-10473 02
- Instrumentation for measuring low-level  
currents/voltages  
MSC-14855 876-10480 02  
Automated secondary standard for liquid  
flowmeters  
LEWIS-12695 876-10544 06  
Detecting contamination on a metal  
surface  
M-FS-19260 876-10552 06  
Miniature-angular-position transducer  
LANGLEY-11999 876-10555 06  
Pulse detector  
MSC-16268 876-10557 06
- MECHANICAL DEVICES**  
Exercise support for therapy  
LANGLEY-11975 876-10074 05  
Cyclical biobidirectional rotary actuator  
GSFC-11883 876-10117 07  
Roll-forming tubes to header plates  
LEWIS-10513 876-10130 08  
Mechanical positioner  
MSC-15817 876-10245 07  
Safety brake for tape reels  
GSFC-11960 876-10412 07
- MECHANICAL DRIVES**  
Cyclical biobidirectional rotary actuator  
GSFC-11883 876-10117 07  
Cable-load equalization system  
MSC-17494 876-10230 06  
Heavy-duty mechanical sequencer  
MSC-19536 876-10418 07  
DC drive system for cine/pulse  
cameras  
MSC-16085 876-10497 03
- MECHANICAL MEASUREMENT**  
Rous system  
LANGLEY-12015 876-10215 06  
ROUS bolt-tensioning monitor  
LANGLEY-12016 876-10216 06  
Air-suspended dynamometer table  
NPO-13794 876-10376 06
- MECHANICAL OSCILLATORS**  
Accelerator for biomedical studies  
ARC-10898 876-10367 05
- MECHANICAL PROPERTIES**  
Lightweight orthotic appliances  
LANGLEY-11918 876-10076 05  
Relative stiffness of flat-conductor  
cable  
M-FS-23537 876-10469 01  
General instability analysis  
M-FS-23407 876-10563 06
- MECHANICAL SHOCK**  
Low-onset-rate energy absorber  
MSC-12279 876-10385 06
- MEDICAL ELECTRONICS**  
Physician's modern Black Bag  
MSC-14936 876-10212 05  
Disposable biomedical electrode  
MSC-14623 876-10363 05  
Automated EEG acquisition  
MSC-16111 876-10364 05  
Short-range biotelemetry system  
MSC-16011 876-10369 05
- MEDICAL EQUIPMENT**  
Exercise support for therapy  
LANGLEY-11975 876-10074 05  
Occlusive-cuff controller  
MSC-14836 876-10207 05  
Physician's modern Black Bag  
MSC-14936 876-10212 05  
Disposable biomedical electrode  
MSC-14623 876-10363 05  
Rocking-motion sensor for the blind  
MSC-14805 876-10366 05  
Multiposition rescue litter  
MSC-16148 876-10368 05
- Interlocking butterfly tourniquet  
MSC-19382 876-10532 05
- MEDICAL PERSONNEL**  
Physician's modern Black Bag  
MSC-14936 876-10212 05
- MEDICAL SCIENCE**  
Measuring mandibular motions  
ARC-10956 876-10362 05
- MEDICAL SERVICES**  
Physician's modern Black Bag  
MSC-14936 876-10212 05
- MEMBRANES**  
Membrane has high urea-rejection  
properties  
ARC-10980 876-10518 04
- MERCATOR PROJECTION**  
Digital image-rectification system  
GSFC-12156 876-10513 03
- MERCURY LAMPS**  
Increased safety in mercury-containing  
devices  
M-FS-23308 876-10013 01
- METABOLIC WASTES**  
Signal processing and display for  
electrochemical data  
LANGLEY-11922 876-10327 02  
Remote water-monitoring system  
LANGLEY-11973 876-10365 05  
Extraction of urea and ammonium ion  
ARC-11064 876-10515 04
- METAL BONDING**  
Simplified explosive-weld evaluation  
MSC-14654 876-10228 06  
Analysis of bonded joints  
LANGLEY-11871 876-10231 06  
Borosilicate glass-to-Kovar tube  
bonding  
GSFC-12077 876-10278 08  
Technique for joining metal tubing  
ARC-10946 876-10279 08  
Transducer bonding kit  
MSC-19690 876-10587 08
- METAL CRYSTALS**  
Containerless processing of tungsten  
M-FS-23509 876-10422 08
- METAL CUTTING**  
Rotary broaches  
M-FS-23374 876-10248 07
- METAL DRAWING**  
Acoustic-energy shaping of meltable  
metals  
NPO-13802 876-10423 08
- METAL FATIGUE**  
Stress-corrosion cracking due to  
hydrazine  
ARC-11093 876-10526 04
- METAL FILMS**  
Reduced costs for solar-cell modules  
LEWIS-12185 876-10427 08
- METAL FINISHING**  
Passive thermal-control coatings  
M-FS-22794 876-10071 04  
Vapor corrosion inhibitors  
M-FS-19232 876-10206 04  
Detection of surface impurities on  
processed metals  
MSC-19670 876-10553 06  
Aluminum transfer method for plating  
plastics  
MSC-16221 876-10593 08
- METAL JOINTS**  
Precision centering vise  
KSC-11041 876-10409 07  
Explosive-seam welding seals large  
pressure vessels  
LANGLEY-12132 876-10588 08

**METAL OXIDE SEMICONDUCTORS**

CMOS-compatible tristate cable driver  
M-FS-23410 876-10149 01

**METAL PLATES**

Metal structures with parallel pores  
GSFC-10984 876-10131 08

**METAL POLISHING**

Polishing technique for beryllium mirror  
M-FS-22923 876-10049 03

**METAL POWDER**

Aluminum transfer method for plating plastics  
MSC-16221 876-10593 08

**METAL SURFACES**

Detecting contamination on a metal surface  
M-FS-19260 876-10552 06

Detection of surface impurities on processed metals  
MSC-19670 876-10553 06

Electric heating for metal surface hardening  
M-FS-19268 876-10580 08

**METAL VAPORS**

Efficient copper-vapor pulsed laser  
NPO-13449 876-10341 03

**METAL WORKING**

Roll-forming tubes to header plates  
LEWIS-10513 876-10130 08

Metalworking method for composites  
M-FS-23354 876-10132 08

Improved soldering iron tip  
M-FS-19349 876-10145 01

Crack-growth analysis  
M-FS-23320 876-10243 06

Hand and power tools  
HQN-10892 876-10257 07

Method of removing drilling chips  
M-FS-19235 876-10262 08

Diffusion brazing nickel-plated stainless steel  
MSC-19322 876-10265 08

Improved photochemical etching of stainless steel  
MSC-19728 876-10268 08

Ablative-filled honeycomb composites  
LANGLEY-11180 876-10273 08

Compound solder joints  
LANGLEY-11444 876-10274 08

Technique for joining metal tubing  
ARC-10946 876-10279 08

Annealing strained alloy 718  
M-FS-19242 876-10284 08

Acoustic-energy shaping of meltable metals  
NPO-13802 876-10423 08

Detection of surface impurities on processed metals  
MSC-19670 876-10553 06

Forming hard aluminum in complex shapes  
MSC-19693 876-10579 08

**METAL-METAL BONDING**

Polymer adhesives for hybrid circuits  
M-FS-23287 876-10015 01

Combined joining process for dissimilar metals A concept  
MSC-19323 876-10127 08

Diffusion brazing nickel-plated stainless steel  
MSC-19322 876-10265 08

Compound solder joints  
LANGLEY-11444 876-10274 08

**METALLIZING**

Polymer adhesives for hybrid circuits  
M-FS-23287 876-10015 01

**METALLOGRAPHY**

Determining eutectic composition in metal alloys  
LEWIS-12633 876-10520 04

**METALLURGY**

Comparative thermal fatigue resistance  
LEWIS-12563 876-10062 04

Metalworking method for composites  
M-FS-23354 876-10132 08

**METEOROLOGICAL INSTRUMENTS**

Quartz-crystal-oscillator hygrometer  
GSFC-12153 876-10349 03

**METEOROLOGICAL PARAMETERS**

Relative humidity from psychrometric data  
FRC-10108 876-10285 09

**METEOROLOGICAL SATELLITES**

Remote, unattended forest fire detector  
M-FS-21221 876-10077 05

**MICA**

Fabrication and applications of electrets  
M-FS-23437 876-10429 08

**MICHELSON INTERFEROMETERS**

Servo corrects interferometer-mirror tilt  
NPO-13687 876-10502 03

**MICROBIOLOGY**

Fast measurement of bacterial susceptibility to antibiotics  
GSFC-10246 876-10536 05

**MICROCHANNELS**

Microchannel detector array for X-rays and UV  
M-FS-23324 876-10053 03

**MICRODENSITOMETERS**

CONVERT Technique and computer program for calculating photographic film-density variations  
LANGLEY-11873 876-10057 03

Document restoration by computer techniques  
HQN-10910 876-10597 09

**MICROELECTRONICS**

Economical custom LSI arrays  
M-FS-23262 876-10004 01

Organic adhesives for hybrid microcircuits  
M-FS-23370 876-10014 01

Polymer adhesives for hybrid circuits  
M-FS-23287 876-10015 01

Reliability of hybrid microcircuit bonding  
M-FS-23358 876-10129 08

**MICROMODULES**

Guidelines for multiple LSI packaging  
M-FS-23367 876-10159 01

Microprogrammable module  
MSC-19456 876-10312 01

**MICROORGANISMS**

Signal processing and display for electrochemical data  
LANGLEY-11922 876-10327 02

Remote water-monitoring system  
LANGLEY-11973 876-10365 05

**MICROPROGRAMMING**

Microprogramming for real-time data acquisition  
KSC-11027 876-10328 02

**MICROSCOPES**

Optical devices  
HQN-10891 876-10188 03

**MICROTHRUST**

Propellant side feed  
LANGLEY-11082 876-10094 06

**MICROWAVE AMPLIFIERS**

UHF/microwave oscillator/amplifier  
GSFC-12113 876-10455 01

Fabrication of ultra-low-noise amplifier  
GSFC-12186 876-10596 08

**MICROWAVE ANTENNAS**

Free-space microwave-power transmission  
M-FS-23443 876-10162 02

Low-cost dual-frequency microwave antenna  
MSC-16100 876-10462 01

Active retrodirective antenna  
NPO-13641 876-10463 01

Multifrequency broadband, dual-polarized antenna  
NPO-13866 876-10464 01

**MICROWAVE FILTERS**

RAM digital filter  
NPO-13659 876-10316 01

**MICROWAVE OSCILLATORS**

UHF/microwave oscillator/amplifier  
GSFC-12113 876-10455 01

**MICROWAVE RADIOMETERS**

Temperature reference for microwave radiometer calibration  
LANGLEY-11355 876-10503 03

**MICROWAVE SWITCHING**

Effects of mismatch on group delay of microwave transmission  
NPO-13863 876-10478 02

**MICROWAVES**

Temperature reference for microwave radiometer calibration  
LANGLEY-11355 876-10503 03

**MIE SCATTERING**

Economical measurement of particle concentration  
GSFC-12088 876-10332 03

**MILLIMETER WAVES**

Low-cost dual-frequency microwave antenna  
MSC-16100 876-10462 01

**MILLING (MACHINING)**

Rotary broaches  
M-FS-23374 876-10248 07

Hand and power tools  
HQN-10892 876-10257 07

**MINIATURE ELECTRONIC EQUIPMENT**

Plug-in circuit monitor  
MSC-19455 876-10311 01

Microprogrammable module  
MSC-19456 876-10312 01

UHF/microwave oscillator/amplifier  
GSFC-12113 876-10455 01

**MINIATURIZATION**

Printed-circuit solar-cell array  
M-FS-23128 876-10007 01

**MIRRORS**

Polishing technique for beryllium mirror  
M-FS-22923 876-10049 03

Combined GaAs laser outputs  
M-FS-23397 876-10173 03

Low-reflectivity spectrally selective coating  
GSFC-12114 876-10184 03

Active optics simulation system  
LANGLEY-12104 876-10512 03

**MISSILE TRAJECTORIES**

Impact of a solid body with water  
M-FS-23512 876-10560 06

Mixing ingredients in foam dispenser  
M-FS-20607 876-10592 08

Mixing ingredients in foam dispenser  
M-FS-20607 876-10592 08

**MODEMS**

Remote access of modem by digital control  
GSFC-11943 876-10022 02

**MODULATION**

Demodulator aids synchronization  
NPO-13605 876-10164 02

**MODULES**

Removal of encapsulating materials  
GSFC-11696 876-10143 01

**MODULUS OF ELASTICITY**

Yield-pressure determination  
MSC-14655 876-10581 08

**MOISTURE CONTENT**

Remote sensing of vegetation and soil  
GSFC-11976 876-10490 03

**MOISTURE METERS**

Quartz-crystal-oscillator hygrometer  
GSFC-12153 876-10349 03  
Remote moisture-content balance  
ARC-11032 876-10492 03

**MOLDING MATERIALS**

Low-pressure low-temperature molding process  
MSC-19778 876-10425 08  
Aluminum transfer method for plating plastics  
MSC-16221 876-10593 08

**MOLDS**

Low-pressure low-temperature molding process  
MSC-19778 876-10425 08

**MOMENTUM THEORY**

Impact response analyses  
M-FS-23335 876-10559 06

**MONITORS**

Continuous HCl in air indicator  
NPO-13474 876-10060 04  
Remote unattended forest fire detector  
M-FS-21221 876-10077 05  
Signal level detector  
NPO-13272 876-10310 01  
Plug-in circuit monitor  
MSC-19455 876-10311 01  
AC adapter for fuel-flow sensor  
GSFC-12037 876-10387 06  
Caution and warning system  
MSC-16046 876-10531 05

**MONOCHROMATORS**

Miniature carbon dioxide sensor  
MSC-16009 876-10344 03

**MONOMERS**

Second-generation PMR polyimides  
LEWIS-12738 876-10359 04

**MONTE CARLO METHOD**

Multivariate normal integration  
M-FS-22867 876-10288 09

**MOTION**

Analog data recording on MnBi film  
NPO-13302 876-10175 03

**MOTION PERCEPTION**

Tracking system for moving subjects  
HQN-10880 876-10028 02  
Rocking-motion sensor for the blind  
MSC-14805 876-10366 05

**MOTION PICTURES**

DC drive system for cine/pulse cameras  
MSC-16085 876-10497 03

**MOTION SIMULATORS**

Video simulator with electronic ranging  
MSC-14965 876-10474 02

**MOTION STABILITY**

Rocking-motion sensor for the blind  
MSC-14805 876-10366 05  
Spin-rate control device  
ARC-10884 876-10417 07

**MOTORS**

Powered wheel for aircraft  
LANGLEY-12053 876-10411 07  
Ironless-armature brushless motor  
GSFC-11880 876-10476 02

**MTBF**

Pump failure monitor  
M-FS-23366 876-10219 06

**MULLITES**

Coatings for mullite insulation  
LANGLEY-11150 876-10067 04

**MULTILAYER INSULATION**

Thermal insulation for high-temperature systems  
GSFC-10954 876-10064 04  
Nondestructive inspection of multilayered insulation  
M-FS-22191 876-10128 08  
Improved insulation material  
MSC-14642 876-10197 04  
External heater for cryogenic vessels  
MSC-14056 876-10337 03  
Fuel-cell powerplant insulation  
MSC-16012 876-10426 08  
Multilayer insulative systems  
LANGLEY-12057 876-10528 04

**MULTIPLEXING**

General-purpose data link  
M-FS-22714 876-10025 02  
Unichromatic-carrier color-TV system  
MSC-14683 876-10026 02  
Flexible high-speed instrumentation system  
FRC-10110 876-10483 02  
Data system for multiplexed water-current meters  
M-FS-23343 876-10493 03

**MULTISPECTRAL BAND SCANNERS**

DAM - detection and mapping  
MSC-16096 876-10370 05  
Digital image-rectification system  
GSFC-12156 876-10513 03  
CAMSP Classification and Mensuration Software Package  
MSC-14979 876-10600 09

**MULTISPECTRAL PHOTOGRAPHY**

Multispectral-scanner image processing  
GSFC-12135 876-10508 03  
Multispectral imaging for medical diagnosis  
NPO-13922 876-10540 05

**MULTIVARIATE STATISTICAL ANALYSIS**

Multivariate normal integration  
M-FS-22867 876-10288 09

**MUSCULOSKELETAL SYSTEM**

In vivo bone-strain telemetry  
ARC-11074 876-10535 05

**MYLAR (TRADEMARK)**

Improved insulation material  
MSC-14642 876-10197 04

**MYOCARDIUM**

Myocardial wall-thickness transducer  
NPO-13644 876-10075 05

**N****NAVIER-STOKES EQUATION**

COMOC a finite-element algorithm for the Navier-Stokes equations  
LANGLEY-11480 876-10241 06

**NAVIGATION AIDS**

All-weather ice information system  
LEWIS-12638 876-10018 02

**Video display synthesizer**

MSC-14620 876-10052 03

**NAVIGATION INSTRUMENTS**

Pulse transformer for GaAs laser  
M-FS-23399 876-10185 03  
Low-cost pressure-data encoder  
NPO-13692 876-10303 01

**NEGATIVE RESISTANCE CIRCUITS**

UHF/microwave oscillator/amplifier  
GSFC-12113 876-10455 01

**NEPHELOMETERS**

Introducing controlled matter into a fluid system  
M-FS-24309 876-10093 06  
Economical measurement of particle concentration  
GSFC-12088 876-10332 03

**NEURISTORS**

Superconductive neuristor R-junction  
HQN-10871 876-10003 01

**NEUROPHYSIOLOGY**

Manual dexterity evaluator  
LANGLEY-12022 876-10209 05

**NEWTON-RAPHSON METHOD**

Determining aircraft stability and control derivatives  
FRC-10109 876-10402 06

**NICHROME (TRADEMARK)**

Polishing gold and gold-alloy crystals  
M-FS-22800 876-10263 08

**NICKEL ALLOYS**

Thermal fatigue-and-oxidation-resistant alloy  
LEWIS-12564 876-10061 04  
Comparative thermal fatigue resistance  
LEWIS-12563 876-10062 04  
Polishing gold and gold-alloy crystals  
M-FS-22800 876-10263 08  
One-wire thermocouple  
MSC-16220 876-10556 06

**NICKEL CADMIUM BATTERIES**

Battery-cell thermal test facility  
M-FS-23040 876-10124 08  
Compact reconditioner for Ni/Cd cells  
M-FS-23270 876-10141 01

**NICKEL PLATE**

Diffusion brazing nickel-plated stainless steel  
MSC-19322 876-10265 08

**NITROBENZENES**

Novel aminobenzyl and imidobenzyl benzenes  
LANGLEY-11843 876-10058 04

**NITROGEN**

Atmosphere-generating system  
MSC-14713 876-10389 06

**NITROUS OXIDES**

Portable solar radiometer measures stack-plume effluents  
LANGLEY-12123 876-10491 03

**NOISE PROPAGATION**

Acoustic testing of materials  
LANGLEY-11659 876-10550 06

**NOISE REDUCTION**

Thermal/acoustical insulation foam  
MSC-14795 876-10195 04  
Shadow mask for X-ray spectrometer  
GSFC-12131 876-10348 03  
Biased-circuit digital data line receiver  
MSC-14967 876-10457 01

**NOISE SPECTRA**

Receiver performance evaluator  
NPO-13701 876-10324 02

**NOISE TEMPERATURE**

Fabrication of ultra-low-noise amplifier  
GSFC-12186 876-10596 08



**NOMOGRAPHS**

Nomograph for castor-cushion design  
MSC-17094 B76-10229 06

**NONDESTRUCTIVE TESTS**

Nondestructive inspection of multilayered insulation  
M-FS-22191 B76-10128 08  
Computer-automated ultrasonic inspection system  
M-FS-23338 B76-10217 06  
Ultrasonic measurement of fracture toughness  
LEWIS-12642 B76-10372 06  
Nondestructive interior examination of moving parts  
M-FS-23378 B76-10545 06  
Ultrasonic monitoring of crack extension  
LEWIS-12632 B76-10547 06

**NONFLAMMABLE MATERIALS**

Experimental data for new fire-retardant materials  
MSC-16022 B76-10361 04

**NORMAL DENSITY FUNCTIONS**

Bit-error rates in optical communications  
M-FS-23340 B76-10286 09

**NOSE CONES**

Tangent-ogive nose cones  
GSFC-11468 B76-10107 06

**NOZZLE DESIGN**

Mixing ingredients in foam dispenser  
M-FS-20607 B76-10592 08

**NOZZLE INSERTS**

Mixing ingredients in foam dispenser  
M-FS-20607 B76-10592 08

**NUCLEAR RADIATION**

Solid-state particle detectors  
GSFC-11785 B76-10142 01

**NUCLEATION**

Nucleation of electronic-crystal regions  
B76-10524 04

**NUMERICAL ANALYSIS**

Selective image enhancement  
M-FS-23364 B76-10021 02  
Guide for testing numerical-integration subroutines  
NPO-11644 B76-10135 09  
Math model of 3-D aircraft configuration  
LANGLEY-12029 B76-10400 06  
Curvilinear bicubic-spline-fit interpolation  
LANGLEY-11391 B76-10434 09  
Electrostatic analysis of charge-coupled structures  
M-FS-23507 B76-10472 01  
Development ephemeris number 96  
NPO-14002 B76-10507 03  
Active optics simulation system  
LANGLEY-12104 B76-10512 03  
Multilayer insulative systems  
LANGLEY-12057 B76-10528 04  
Rapid kinetics  
LANGLEY-12140 B76-10529 04  
Estimating aircraft states  
ARC-10969 B76-10567 06  
Systems improved numerical differencing analyzer  
MSC-13805 B76-10609 09  
Input/output error analyzer  
GSFC-12132 B76-10610 09

**NUMERICAL INTEGRATION**

Analytic numerical solutions for shock waves  
ARC-10959 B76-10096 06

Guide for testing numerical-integration subroutines  
NPO-11644 B76-10135 09

Crack-growth analysis  
M-FS-23320 B76-10243 06

**NUTRITION**

Meal system for the elderly  
MSC-16062 B76-10530 05

**NUTS (FASTENERS)**

High-torque open-end wrench  
NPO-13541 B76-10405 07

**O**

**O RING SEALS**

Cost saving synergistic shaft seal  
LEWIS-12119 B76-10081 06  
Reducing cold flow in elastomeric O-rings  
M-FS-24336 B76-10086 06  
Soft seat A-N fitting for vacuum use  
LEWIS-10130 B76-10408 07

**OBSERVATION AIRCRAFT**

All-weather ice information system  
LEWIS-12638 B76-10018 02

**OCCLUSION**

Measuring mandibular motions  
ARC-10956 B76-10362 05

**OCEANOGRAPHY**

DAM - detection and mapping  
MSC-16096 B76-10370 05

**OGIVES**

Tangent-ogive nose cones  
GSFC-11468 B76-10107 06  
Cavitating performance of pumping machinery  
LEWIS-12423 B76-10394 06

**OHMS LAW**

Thermal network modeling handbook  
MSC-14964 B76-10236 06

**OPERATIONAL AMPLIFIERS**

Hybrid thin-film amplifier  
MSC-13975 B76-10314 01

**OPTICAL COMMUNICATION**

Voltage control for corona charging thermoplastics  
M-FS-23102 B76-10043 03  
Electrode structure for uniform corona discharge  
M-FS-22617 B76-10045 03  
Simplified deflection-coil linearity testing  
M-FS-23400 B76-10180 03  
Bit-error rates in optical communications  
M-FS-23340 B76-10286 09  
Stabilized Nd YAG laser output  
GSFC-11571 B76-10335 03  
Analysis of laser heterodyne communications  
GSFC-12098 B76-10511 03

**OPTICAL CORRECTION PROCEDURE**

Optical alignment system  
ARC-10932 B76-10178 03  
Servo corrects interferometer-mirror tilt  
NPO-13687 B76-10502 03

**OPTICAL DATA PROCESSING**

Photorefractive page composer  
M-FS-23419 B76-10171 03  
CAMSP Classification and Mensuration Software Package  
MSC-14979 B76-10600 09

**OPTICAL DENSITY**

Readout method for stored information  
NPO-13243 B76-10029 02

**OPTICAL EMISSION SPECTROSCOPY**

Calibration source for sensitive optical detectors  
LANGLEY-11625 B76-10036 03  
Tunable acoustical optical filter  
NPO-13640 B76-10340 03

**OPTICAL EQUIPMENT**

Stepping optical path difference in an interferometer  
NPO-13569 B76-10033 03  
Light pipes for LED measurements  
GSFC-11887 B76-10034 03  
Calibration source for sensitive optical detectors  
LANGLEY-11625 B76-10036 03  
Measurement of transient reflectance  
M-FS-23160 B76-10037 03  
Calibration of image dissector tubes  
M-FS-22208 B76-10055 03  
Photorefractive page composer  
M-FS-23419 B76-10171 03  
Optical alignment system  
ARC-10932 B76-10178 03  
Low-reflectivity spectrally selective coating  
GSFC-12114 B76-10184 03  
Optical devices  
HQN-10891 B76-10188 03  
Pinhole diffraction filter  
GSFC-12120 B76-10333 03  
Vacuum-ultraviolet reflectometer  
MSC-14995 B76-10336 03  
Measuring scatter angle from mirrors  
M-FS-23421 B76-10342 03  
Color to black-and-white converter  
MSC-12618 B76-10346 03  
Differential-optoacoustic absorption detector  
NPO-13759 B76-10494 03  
Spatially-coherent coupled semiconductor lasers  
M-FS-23396 B76-10500 03

**OPTICAL FILTERS**

Unichromatic-carrier color-TV system  
MSC-14683 B76-10026 02  
Combined GaAs laser outputs  
M-FS-23397 B76-10173 03  
Low-reflectivity spectrally selective coating  
GSFC-12114 B76-10184 03  
Color to black-and-white converter  
MSC-12618 B76-10346 03

**OPTICAL HETERODYNING**

Hologram-reconstruction signal enhancement  
M-FS-23104 B76-10343 03  
Analysis of laser heterodyne communications  
GSFC-12098 B76-10511 03

**OPTICAL MEASUREMENT**

Measurement of transient reflectance  
M-FS-23160 B76-10037 03

**OPTICAL MEASURING INSTRUMENTS**

Laser extensometer  
M-FS-19259 B76-10030 03  
Stepping optical path difference in an interferometer  
NPO-13569 B76-10033 03  
Ellipsometer for measurement in ultrahigh vacuum  
M-FS-23130 B76-10035 03  
Calibration source for sensitive optical detectors  
LANGLEY-11625 B76-10036 03  
Optical bias assembly  
MSC-14412 B76-10051 03

Quantitative bioluminescent detection of bacteria  
 GSFC-12003 876-10073 05  
 Double-exposure holographic interferometer  
 NPO-13796 876-10169 03  
 Laser particulate spectrometer  
 MSC-14969 876-10331 03  
 Economical measurement of particle concentration  
 GSFC-12088 876-10332 03  
 Optical profilometer  
 LANGLEY-11869 876-10338 03  
 Monitor for optical-window contamination  
 ARC-10947 876-10345 03  
 Improved resolution for sensor arrays  
 NPO-13745 876-10439 01  
 Precision measurement of changes in physical dimensions  
 M-FS-23527 876-10543 06  
 Visual projection reticle  
 ARC-10976 876-10590 08  
**OPTICAL MEMORY (DATA STORAGE)**  
 Hologram-reconstruction signal enhancement  
 M-FS-23104 876-10343 03  
**OPTICAL PROPERTIES**  
 Ellipsometer for measurement in ultrahigh vacuum  
 M-FS-23130 876-10035 03  
 Active optics simulation system  
 LANGLEY-12104 876-10512 03  
**OPTICAL RADAR**  
 Two-wavelength dye laser  
 LANGLEY-12012 876-10170 03  
 Wind velocity measurement  
 M-FS-23362 876-10172 03  
 Tunable acoustical optical filter  
 NPO-13640 876-10340 03  
**OPTICAL RANGE FINDERS**  
 Infrared range sensor  
 ARC-10885 876-10475 02  
**OPTICAL REFLECTION**  
 Measurement of transient reflectance  
 M-FS-23160 876-10037 03  
 Low-reflectivity spectrally selective coating  
 GSFC-12114 876-10184 03  
 Optical profilometer  
 LANGLEY-11869 876-10338 03  
 Monitor for optical-window contamination  
 ARC-10947 876-10345 03  
 Thermal/vacuum testing of laser corner-cube retroreflectors  
 M-FS-23565 876-10549 06  
**OPTICAL SCANNERS**  
 Uniform solar cells  
 GSFC-11941 876-10125 08  
 Optical profilometer  
 LANGLEY-11869 876-10338 03  
 Document restoration by computer techniques  
 HQN-10910 876-10597 09  
**OPTICAL TRACKING**  
 Low-reflectivity spectrally selective coating  
 GSFC-12114 876-10184 03  
**OPTICS**  
 Measurement of transient reflectance  
 M-FS-23160 876-10037 03  
 Field distribution in a thin lens  
 LANGLEY-11392 876-10179 03  
**OPTIMAL CONTROL**  
 Optimal insensitive-controller synthesis  
 M-FS-21666 876-10103 06

**OPTIMIZATION**  
 ESOP Version IV Energy systems optimization program  
 MSC-14854 876-10106 06  
 Transformer design tradeoffs  
 NPO-13755 876-10470 01  
**ORBIT CALCULATION**  
 SANDTRACKS World map and stations predictions computer programs  
 GSFC-12099 876-10190 03  
 GEODYN Orbital and geodetic parameter estimation  
 GSFC-12014 876-10396 06  
**ORBITAL POSITION ESTIMATION**  
 SANDTRACKS World map and stations predictions computer programs  
 GSFC-12099 876-10190 03  
**ORGANIC SILICON COMPOUNDS**  
 Abrasion-resistant coatings for plastic surfaces  
 ARC-10915 876-10201 04  
**ORGANIC WASTES (FUEL CONVERSION)**  
 Energy conversion system  
 NPO-13510 876-10485 03  
**ORGANIZATIONS**  
 Business capabilities file  
 NPO-13834 876-10136 09  
**ORGANOMETALLIC COMPOUNDS**  
 Catalysts for low-energy aldehyde processes  
 NPO-13827 876-10519 04  
**ORIFICE FLOW**  
 Venting for condensation in gas lines  
 MSC-19621 876-10109 06  
**ORTHICONS**  
 Improved collimator for imaging system  
 M-FS-22863 876-10038 03  
**ORTHOPEDECS**  
 Exercise support for therapy  
 LANGLEY-11975 876-10074 05  
 Lightweight orthotic appliances  
 LANGLEY-11918 876-10076 05  
 Graphite-reinforced bone cement  
 NPO-13764 876-10211 05  
**ORTHOTROPIC SHELLS**  
 Analysis of axisymmetric shell structure  
 LANGLEY-12059 876-10398 06  
**OSCILLATION DAMPERS**  
 Fluid-film bearing damper  
 LEWIS-11158 876-10378 06  
**OSCILLATORS**  
 Electronic circuits  
 HQN-10894 876-10156 01  
 Doppler extraction with a digital VCO  
 MSC-14814 876-10452 01  
 UHF/microwave oscillator/amplifier  
 GSFC-12113 876-10455 01  
**OSMOSIS**  
 Membrane has high urea-rejection properties  
 ARC-10980 876-10518 04  
**OUTER PLANETS EXPLORERS**  
 Shock-tube driver  
 NPO-13528 876-10090 06  
**OUTGASSING**  
 Organic adhesives for hybrid microcircuits  
 M-FS-23370 876-10014 01  
 Reduction of acoustic losses by outgassing  
 MSC-15985 876-10069 04  
 Slotted bolts and studs for vacuum systems  
 LEWIS-10391 876-10407 07

**OUTLETS**  
 Plug-in light switches  
 M-FS-24183 876-10001 01  
**OVERVOLTAGE**  
 Battery single-cell protection system  
 LEWIS-12039 876-10306 01  
 Purity test for copper-plating solutions  
 M-FS-19298 876-10360 04  
**OXIDATION**  
 Comparative thermal fatigue resistance  
 LEWIS-12563 876-10062 04  
 Chemiluminescent prediction of service life  
 MSC-16010 876-10191 04  
 Catalytic oxidation of waste materials  
 MSC-14831 876-10354 04  
 Electrolyte cells measure oxygen fugacities  
 MSC-16089 876-10523 04  
**OXYFLUORIDES**  
 Determination of trace amounts of POF3  
 LEWIS-10577 876-10356 04  
**OXYGEN MASKS**  
 Firefighter's breathing system  
 MSC-14733 876-10208 05  
**OXYGEN SUPPLY EQUIPMENT**  
 Atmosphere-generating system  
 MSC-14713 876-10389 06  
 Miniature emergency oxygen unit  
 KSC-11011 876-10539 05  
**OXYGEN TENSION**  
 Electrolyte cells measure oxygen fugacities  
 MSC-16089 876-10523 04

P

**P-N-P JUNCTIONS**  
 IGFET/SOI fabrication method  
 M-FS-23312 876-10259 08  
**P-TYPE SEMICONDUCTORS**  
 Semiconductor ohmic contact  
 LANGLEY-11691 876-10461 01  
**PACKAGING**  
 Compressed air cylinder pallet  
 MSC-19217 876-10203 04  
 Inexpensive tags for tubes or cables  
 LEWIS-12676 876-10584 08  
**PACKINGS (SEALS)**  
 Improved cryogenic shaft seals  
 M-FS-19153 876-10080 06  
 Split-ring seal  
 MSC-14304 876-10247 07  
 Fundamentals of fluid sealing  
 LEWIS-12683 876-10392 06  
**PADDLES**  
 Paddle-pin alignment test  
 KSC-10740 876-10388 06  
**PALMGREN-MINER RULE**  
 Fatigue life of spur and helical gear sets  
 LEWIS-12596 876-10224 06  
**PANELS**  
 Age-forming aluminum panels  
 MSC-12648 876-10281 08  
 Modular multipurpose panel support  
 MSC-19641 876-10421 08  
 Improved bonding of honeycomb panels  
 MSC-19560 876-10428 08  
**PARABOLIC REFLECTORS**  
 Horizontally-mounted solar collector  
 M-FS-23349 876-10256 07

**PARALLEL COMPUTERS**

- Partitioned counting digital filter  
NPO-11832 B76-10298 01
- PARAMETERIZATION**  
Control system design  
LEWIS-12556 B76-10404 06  
Processing equations for state-space models  
LEWIS-12555 B76-10438 09
- PARAMETRIC AMPLIFIERS**  
Fabrication of ultra-low-noise amplifier  
GSFC-12186 B76-10596 08
- PARTIAL PRESSURE**  
Electrolyte cells measure oxygen fugacities  
MSC-16089 B76-10523 04  
Multispecies transient simulator  
MSC-14862 B76-10527 04
- PARTICLE DENSITY (CONCENTRATION)**  
A forward-scatter polarimeter for chemical analysis  
NPO-13756 B76-10334 03  
Contamination monitoring of fluids  
KSC-11037 B76-10382 06
- PARTICLE SIZE DISTRIBUTION**  
Standard aerosols for particle velocimeters  
M-FS-23075 B76-10050 03  
Fluid classifier and disseminator  
HQN-10748 B76-10089 06  
Laser particulate spectrometer  
MSC-14969 B76-10331 03  
Economical measurement of particle concentration  
GSFC-12088 B76-10332 03  
A forward-scatter polarimeter for chemical analysis  
NPO-13756 B76-10334 03  
Contamination monitoring of fluids  
KSC-11037 B76-10382 06
- PARTICLES**  
Standard aerosols for particle velocimeters  
M-FS-23075 B76-10050 03  
Fluid classifier and disseminator  
HQN-10748 B76-10089 06  
Solid-state particle detectors  
GSFC-11785 B76-10142 01
- PARTICULATE SAMPLING**  
Continuous HCl in air indicator  
NPO-13474 B76-10060 04  
Fluid classifier and disseminator  
HQN-10748 B76-10089 06  
Introducing controlled matter into a fluid system  
M-FS-24309 B76-10093 06  
Fabrication and applications of electrets  
M-FS-23437 B76-10429 08  
Portable wind sensitive directional air sampler  
LEWIS-12743 B76-10489 03
- PATTERN RECOGNITION**  
Anamorphic lens for tracking system  
NPO-13062 B76-10046 03
- PATTERN REGISTRATION**  
CAMSP Classification and Mensuration Software Package  
MSC-14979 B76-10600 09
- PCM TELEMETRY**  
PN ranging/telemetry transmission  
GSFC-12017 B76-10323 02  
Receiver performance evaluator  
NPO-13701 B76-10324 02
- PEELING**  
Stripper for silicone polymers  
MSC-19380 B76-10267 08

**PELTIER EFFECTS**

- Elimination of thermally generated EMF's on PC boards  
MSC-16125 B76-10594 08
- PERCEPTION**  
Video simulator with electronic ranging  
MSC-14965 B76-10474 02
- PERFORMANCE PREDICTION**  
Control system design  
LEWIS-12556 B76-10404 06
- PERFORMANCE TESTS**  
Graphical methods for variable sampling plans  
MSC-19279 B76-10431 08
- PERMALLOYS (TRADEMARK)**  
Composite stacked moly-permalloy cores  
NPO-13578 B76-10294 01  
Simplified cut-core inductor  
NPO-13600 B76-10317 01  
A passive chevron replicator  
LANGLEY-11906 B76-10441 01
- PERMEABILITY**  
Composite stacked moly-permalloy cores  
NPO-13578 B76-10294 01
- PHARMACOLOGY**  
Leak testing glass ampoules  
LANGLEY-11988 B76-10551 06
- PHASE COHERENCE**  
Combined GaAs laser outputs  
M-FS-23397 B76-10173 03
- PHASE DEMODULATORS**  
Unbalanced quadrature demodulator  
MSC-14840 B76-10161 02
- PHASE DETECTORS**  
Sensor for analog speed controls  
LEWIS-12597 B76-10020 02  
Tracking a phase-shift-keyed signal  
MSC-16170 B76-10481 02
- PHASE ERROR**  
Unbalanced quadrature demodulator  
MSC-14840 B76-10161 02
- PHASE LOCK DEMODULATORS**  
A linear phase demodulator  
GSFC-12018 B76-10291 01
- PHASE LOCKED SYSTEMS**  
Sensor for analog speed controls  
LEWIS-12597 B76-10020 02  
Manchester transition tracking loop (MTTL)  
MSC-14842 B76-10319 02  
Open-loop digital frequency multiplier  
MSC-12709 B76-10447 01  
Doppler extraction with a digital VCO  
MSC-14814 B76-10452 01  
Active retrodirective antenna  
NPO-13641 B76-10463 01  
Tracking a phase-shift-keyed signal  
MSC-16170 B76-10481 02
- PHASE SHIFT CIRCUITS**  
Electronic circuits  
HQN-10894 B76-10156 01  
Subcarrier signal combiner for arrayed antennas  
NPO-13723 B76-10329 02
- PHASE SHIFT KEYING**  
Long binary frame sync words  
NPO-13727 B76-10163 02  
Demodulator aids synchronization  
NPO-13605 B76-10164 02  
A linear phase demodulator  
GSFC-12018 B76-10291 01  
Tracking a phase-shift-keyed signal  
MSC-16170 B76-10481 02

**PHENOLS**

- Polymeric foams stable at high temperatures  
ARC-11008 B76-10065 04
- PHOSPHORUS COMPOUNDS**  
Determination of trace amounts of POF3  
LEWIS-10577 B76-10356 04
- PHOTOCATHODES**  
Anamorphic lens for tracking system  
NPO-13062 B76-10046 03  
Microchannel detector array for X-rays and UV  
M-FS-23324 B76-10053 03  
X-ray sensitive oblique imaging device  
GSFC-11935 B76-10504 03
- PHOTOCONDUCTORS**  
Permanent holographic storage medium  
M-FS-22588 B76-10044 03  
Vidicon intensifier  
NPO-11912 B76-10054 03
- PHOTOELECTRICITY**  
JPL solar power experiments  
NPO-13461 B76-10098 06
- PHOTOGRAPHIC DEVELOPERS**  
Image intensification of developed photographs  
M-FS-23461 B76-10495 03  
Solvent for 1-phenyl-3-pyrazolidone in photography  
GSFC-11992 B76-10496 03
- PHOTOGRAPHIC FILM**  
CONVERT Technique and computer program for calculating photographic film-density variations  
LANGLEY-11873 B76-10057 03  
Image intensification of developed photographs  
M-FS-23461 B76-10495 03  
Elimination of color rings on film negatives  
GSFC-12110 B76-10498 03
- PHOTOGRAPHIC MEASUREMENT**  
Standard aerosols for particle velocimeters  
M-FS-23075 B76-10050 03
- PHOTOGRAPHIC PLATES**  
Image intensification of developed photographs  
M-FS-23461 B76-10495 03
- PHOTOGRAPHIC PROCESSING**  
Contrast enhancement of transparencies  
GSFC-11989 B76-10181 03  
Frame for daylight photocopying  
KSC-11026 B76-10406 07  
Image intensification of developed photographs  
M-FS-23461 B76-10495 03  
Elimination of color rings on film negatives  
GSFC-12110 B76-10498 03
- PHOTOGRAPHIC PROCESSING EQUIPMENT**  
Frame for daylight photocopying  
KSC-11026 B76-10406 07
- PHOTOGRAPHS**  
Frame for daylight photocopying  
KSC-11026 B76-10406 07
- PHOTOGRAPHY**  
Optics and lasers  
HQN-10893 B76-10187 03  
DC drive system for cine/pulse cameras  
MSC-16085 B76-10497 03

**PHOTOMETERS**

- Chemiluminescent prediction of service life  
MSC-16010 B76-10191 04

**PHOTOMICROGRAPHY**

- Simplified explosive-weld evaluation  
MSC-14654 B76-10228 06

**PHOTOMULTIPLIER TUBES**

- Quantitative bioluminescent detection of bacteria  
GSFC-12003 B76-10073 05  
Charge-sensitive amplifier with notched frequency response  
LANGLEY-11317 B76-10440 01

**PHOTON BEAMS**

- Two-dimensional photon detector  
M-FS-23325 B76-10048 03  
Simplified deflection-coil linearity testing  
M-FS-23400 B76-10180 03

**PHOTOVOLTAIC CELLS**

- JPL solar power experiments  
NPO-13461 B76-10098 06  
Terrestrial photovoltaic measurements workshop  
LEWIS-12643 B76-10350 03  
Reduced costs for solar-cell modules  
LEWIS-12185 B76-10427 08  
Universal solar-cell terminal  
M-FS-23505 B76-10450 01

**PHOTOVOLTAIC EFFECT**

- Terrestrial photovoltaic measurements workshop  
LEWIS-12643 B76-10350 03

**PHYSICAL EXAMINATIONS**

- Manual dexterity evaluator  
LANGLEY-12022 B76-10209 05

**PHYSICAL EXERCISE**

- Exercise support for therapy  
LANGLEY-11975 B76-10074 05

**PHYSICAL FITNESS**

- Manual dexterity evaluator  
LANGLEY-12022 B76-10209 05

**PHYSICAL PROPERTIES**

- Comparative thermal fatigue resistance  
LEWIS-12563 B76-10062 04  
Handbook of liquid metals  
M-FS-23355 B76-10072 04

**PHYSICIANS**

- Physician's modern 'Black Bag'  
MSC-14936 B76-10212 05

**PHYSIOLOGICAL RESPONSES**

- Manual dexterity evaluator  
LANGLEY-12022 B76-10209 05

**PHYSIOLOGICAL TESTS**

- Manual dexterity evaluator  
LANGLEY-12022 B76-10209 05  
In vivo bone-strain telemetry  
ARC-11074 B76-10535 05  
Fast measurement of bacterial susceptibility to antibiotics  
GSFC-10246 B76-10536 05

**PILOT TRAINING**

- Full-color hybrid display  
ARC-10903 B76-10477 02

**PINS**

- DIP extractor simplifies circuit removal  
MSC-12712 B76-10002 01  
Paddle-pin alignment test  
KSC-10740 B76-10388 06

**PIPELINES**

- Flange weld pressure testing  
M-FS-19292 B76-10546 06

**PIPES (TUBES)**

- Roll-forming tubes to header plates  
LEWIS-10513 B76-10130 08

- Compound solder joints  
LANGLEY-11444 B76-10274 08  
Technique for joining metal tubing  
ARC-10946 B76-10279 08  
Brazing/Rebrazing process for CRES steel  
MSC-19600 B76-10280 08  
High-torque open-end wrench  
NPO-13541 B76-10405 07  
Precision centering vise  
KSC-11041 B76-10409 07  
Energy-absorbing attenuator  
MSC-17473 B76-10419 07

**PITCH (INCLINATION)**

- Air-cushion landing systems  
LANGLEY-11783 B76-10397 06

**PITCHING MOMENTS**

- Time-domain aircraft model  
MSC-16018 B76-10391 06

**PLANET EPHEMERIDES**

- Independent trajectory determination system  
GSFC-11923 B76-10569 06

**PLANNING**

- Prevention of design flaws in multicomputer systems  
MSC-14920 B76-10330 02

**PLASMA JETS**

- Efficient copper-vapor pulsed laser  
NPO-13449 B76-10341 03

**PLASMA WAVES**

- Holography with surface plasma waves  
M-FS-22040 B76-10039 03

**PLASMAS (PHYSICS)**

- Double-exposure holographic interferometer  
NPO-13796 B76-10169 03  
Antireflection coating for plastic lenses  
ARC-10983 B76-10591 08

**PLASTIC COATINGS**

- Solventless intumescent coatings  
ARC-10996 B76-10194 04  
Abrasion-resistant coatings for plastic surfaces  
ARC-10915 B76-10201 04  
Parylene coating for circuit components  
M-FS-23450 B76-10583 08

**PLASTIC DEFORMATION**

- Acoustic-energy shaping of malleable metals  
NPO-13802 B76-10423 08  
Yield-pressure determination  
MSC-14655 B76-10581 08

**PLASTIC FLOW**

- Fundamentals of fluid sealing  
LEWIS-12683 B76-10392 06

**PLASTICS**

- Removal of encapsulating materials  
GSFC-11696 B76-10143 01  
Mixing ingredients in foam dispenser  
M-FS-20607 B76-10592 08  
Aluminum transfer method for plating plastics  
MSC-16221 B76-10593 08

**PLATENS**

- Repair of fused silica platens  
MSC-19713 B76-10276 08

**PLATES**

- Repair of fused silica platens  
MSC-19713 B76-10276 08

**PLATING**

- Detection of surface impurities on processed metals  
MSC-19670 B76-10553 06  
Aluminum transfer method for plating plastics  
MSC-16221 B76-10593 08

**PLATINUM**

- Thermal insulation for high-temperature systems  
GSFC-10954 B76-10064 04

**PLENUM CHAMBERS**

- Conical diffuser for fuel cells  
MSC-14026 B76-10255 07

**PLETHYSMOGRAPHY**

- Occlusive-cuff controller  
MSC-14836 B76-10207 05

**PLOTTERS**

- Graphic-to-digital conversion system  
M-FS-24410 B76-10019 02  
Manual dexterity evaluator  
LANGLEY-12022 B76-10209 05

**PLUGS**

- Plug-in light switches  
M-FS-24183 B76-10001 01

**PLUMES**

- Portable solar radiometer measures stack-plume effluents  
LANGLEY-12123 B76-10491 03  
Thermal-radiation model  
M-FS-23538 B76-10562 06

**PNEUMATIC EQUIPMENT**

- Fluid handling equipment  
HQN-10890 B76-10232 06  
Split-ring seal  
MSC-14304 B76-10247 07

**PNEUMATICS**

- Constant-rate fluid-delivery system  
MSC-14905 B76-10214 06

**POINTING CONTROL SYSTEMS**

- Pointing control/roll positioning mechanism  
M-FS-22809 B76-10121 07

**POISONS**

- Increased safety in mercury-containing devices  
M-FS-23308 B76-10013 01

**POISSON DENSITY FUNCTIONS**

- Simplified deflection-coil linearity testing  
M-FS-23400 B76-10180 03  
Bit-error rates in optical communications  
M-FS-23340 B76-10286 09

**POLARIMETERS**

- A forward-scatter polarimeter for chemical analysis  
NPO-13756 B76-10334 03

**POLARIZATION (CHARGE SEPARATION)**

- Fabrication and applications of electrets  
M-FS-23437 B76-10429 08

**POLARIZATION CHARACTERISTICS**

- Purity test for copper-plating solutions  
M-FS-19298 B76-10360 04

**POLARIZED LIGHT**

- Ellipsometer for measurement in ultrahigh vacuum  
M-FS-23130 B76-10035 03  
Color to black-and-white converter  
MSC-12618 B76-10346 03

**POLAROGRAPHY**

- Purity test for copper-plating solutions  
M-FS-19298 B76-10360 04

**POLISHING**

- Polishing technique for beryllium mirror  
M-FS-22923 B76-10049 03  
Soldering high-impedance Nichrome wire  
M-FS-1457 B76-10264 08

**POLLUTION**

- Catalytic oxidation of waste materials  
MSC-14831 B76-10354 04

- Extracting lignins from mill wastes  
NPO-13847 876-10514 04
- POLLUTION CONTROL**  
Sustained-arc ignition system  
LEWIS-12444 876-10410 07  
Fabrication and applications of electrets  
M-FS-23437 876-10429 08  
Hydrofoil controls outfall effluents in rivers and oceans  
LANGLEY-12045 876-10488 03
- POLLUTION MONITORING**  
Continuous HCl in air indicator  
NPO-13474 876-10060 04  
Portable wind sensitive, directional air sampler  
LEWIS-12743 876-10489 03  
Portable solar radiometer measures stack-plume effluents  
LANGLEY-12123 876-10491 03
- POLYAMIDE RESINS**  
Novel aminobenzyl and imidobenzyl benzenes  
LANGLEY-11843 876-10058 04
- POLYETHYLENE TEREPHTHALATE**  
Improved insulation material  
MSC-14642 876-10197 04
- POLYIMIDE RESINS**  
High-temperature flat-conductor cable  
M-FS-23451 876-10144 01  
Second-generation PMR polyimides  
LEWIS-12738 876-10359 04
- POLYIMIDES**  
Printed-circuit solar-cell array  
M-FS-23128 876-10007 01  
Fuel-cell powerplant insulation  
MSC-16012 876-10426 08
- POLYMER CHEMISTRY**  
Second-generation PMR polyimides  
LEWIS-12738 876-10359 04
- POLYMERIC FILMS**  
Voltage control for corona charging thermoplastics  
M-FS-23102 876-10043 03  
Electrode structure for uniform corona discharge  
M-FS-22617 876-10045 03  
Membrane has high urea-rejection properties  
ARC-10980 876-10518 04  
Parylene coating for circuit components  
M-FS-23450 876-10583 08
- POLYMERIZATION**  
Permanent holographic storage medium  
M-FS-22588 876-10044 03  
Second-generation PMR polyimides  
LEWIS-12738 876-10359 04  
Membrane has high urea-rejection properties  
ARC-10980 876-10518 04  
Antireflection coating for plastic lenses  
ARC-10983 876-10591 08
- POLYMERS**  
Polymer adhesives for hybrid circuits  
M-FS-23287 876-10015 01  
Polymeric foams stable at high temperatures  
ARC-11008 876-10065 04  
Transparent and flame-retardant potting compounds  
MSC-14669 876-10066 04  
Lightweight orthotic appliances  
LANGLEY-11918 876-10076 05  
Stripper for silicone polymers  
MSC-19380 876-10267 08
- POLYMETHYL METHACRYLATE**  
Double-exposure holographic interferometer  
NPO-13796 876-10169 03  
Antireflection coating for plastic lenses  
ARC-10983 876-10591 08
- POLYSULFIDES**  
Solventless intumescent coatings  
ARC-10996 876-10194 04
- POLYURETHANE FOAM**  
Viscoelastic foam cushion  
ARC-11089 876-10525 04  
Mixing ingredients in foam dispenser  
M-FS-20607 876-10592 08
- POPULATION THEORY**  
Birth/death process model  
NPO-13616 876-10213 05
- POROSITY**  
Metal structures with parallel pores  
GSFC-10984 876-10131 08  
Thermal/acoustical insulation foam  
MSC-14795 876-10195 04
- POROUS MATERIALS**  
Reduction of acoustic losses by outgassing  
MSC-15985 876-10069 04  
Improved bonding of honeycomb panels  
MSC-19560 876-10428 08
- POROUS PLATES**  
Metal structures with parallel pores  
GSFC-10984 876-10131 08
- PORTABLE EQUIPMENT**  
Field sampling fine-vacuum system  
KSC-10596 876-10118 07
- POSITION INDICATORS**  
Infrared range sensor  
ARC-10885 876-10475 02  
Recording-tape position sensor  
GSFC-12056 876-10577 07
- POSITIONING**  
Improved photochemical etching of stainless steel  
MSC-19728 876-10268 08
- POSITIONING DEVICES (MACHINERY)**  
Mechanical positioner  
MSC-15817 876-10245 07  
Precision centering vise  
KSC-11041 876-10409 07
- POTASSIUM HYDROXIDES**  
Stripper for silicone polymers  
MSC-19380 876-10267 08
- POTENTIAL FLOW**  
Swept wing aerodynamics  
ARC-10790 876-10403 06
- POTENTIOMETRIC ANALYSIS**  
Signal processing and display for electrochemical data  
LANGLEY-11922 876-10327 02  
Remote water-monitoring system  
LANGLEY-11973 876-10365 05
- POTTING COMPOUNDS**  
Transparent and flame-retardant potting compounds  
MSC-14669 876-10066 04  
Removal of encapsulating materials  
GSFC-11696 876-10143 01  
Low-pressure low-temperature molding process  
MSC-19778 876-10425 08
- POWDERED ALUMINUM**  
Aluminum transfer method for plating plastics  
MSC-16221 876-10593 08
- POWER**  
REDOX - electrochemical energy storage  
LEWIS-12220 876-10070 04
- POWER CONDITIONING**  
Feedback arrangement for regenerative switches  
NPO-13060 876-10302 01
- POWER LINES**  
Electrical-cable design guide  
M-FS-24280 876-10157 01
- POWER SUPPLIES**  
Fluorescent-lamp power supply  
MSC-14900 876-10140 01  
AC adapter for fuel-flow sensor  
GSFC-12037 876-10387 06  
Low-power programmable high-voltage supply  
LANGLEY-11316 876-10458 01
- POWER SUPPLY CIRCUITS**  
Compact reconditioner for Ni/Cd cells  
M-FS-23270 876-10141 01  
Power-control switch  
M-FS-23395 876-10148 01  
A nonsaturating dc-to-dc parallel power converter  
GSFC-12047 876-10290 01  
Toroidal converter core  
NPO-13413 876-10293 01  
Foldback current-limiting for hybrid regulator  
M-FS-22995 876-10301 01  
Feedback arrangement for regenerative switches  
NPO-13060 876-10302 01  
Power supply with optical-isolator control  
HQN-10827 876-10466 01  
Active inrush-current limiter  
GSFC-11789 876-10467 01
- PRECIPITATION (METEOROLOGY)**  
Relative humidity from psychrometric data  
FRC-10108 876-10285 09
- PRECIPITATION PARTICLE MEASUREMENT**  
Fluid classifier and disseminator  
HQN-10748 876-10089 06
- PRESSURE**  
Flange weld pressure testing  
M-FS-19292 876-10546 06
- PRESSURE DROP**  
Vapor/liquid interface sensor  
MSC-12474 876-10220 06
- PRESSURE GAGES**  
ROUS bolt-tensioning monitor  
LANGLEY-12016 876-10216 06
- PRESSURE GRADIENTS**  
Multispecies transient simulator  
MSC-14862 876-10527 04  
Hydrodynamic lubrication of face seals  
LEWIS-12710 876-10558 06
- PRESSURE MEASUREMENTS**  
Fast pressure-sensor system  
LANGLEY-12003 876-10087 06  
Joule-Thomson data curves  
KSC-10538 876-10102 06  
Differential-optoacoustic absorption detector  
NPO-13759 876-10494 03  
Indicated mean-effective pressure instrument  
LEWIS-12661 876-10542 06  
Prefabricated strain-gage connectors  
MSC-19522 876-10595 08

**PRESSURE REGULATORS**

- Firefighter's breathing system  
MSC-14733 B76-10208 05  
Constant-rate fluid-delivery system  
MSC-14905 B76-10214 06  
Gas boost compressor  
MSC-14757 B76-10415 07

**PRESSURE SENSORS**

- Fast pressure-sensor system  
LANGLEY-12003 B76-10087 06  
Pressure tube instrumentation  
LEWIS-12539 B76-10101 06  
Vapor/liquid interface sensor  
MSC-12474 B76-10220 06  
Improved gas-pressure transducer  
ARC-10639 B76-10381 06

**PRESSURE VESSEL DESIGN**

- Ultra-lightweight pressure vessels  
MSC-14983 B76-10266 08

**PRESSURE VESSELS**

- Firefighter's breathing system  
MSC-14733 B76-10208 05  
Fracture mechanics for weld acceptance  
M-FS-23360 B76-10282 08  
Cleaning large tanks and gas bottles  
MSC-14966 B76-10430 09  
Explosive-seam welding seals large pressure vessels  
LANGLEY-12132 B76-10588 08

**PRESSURE WELDING**

- Transducer bonding kit  
MSC-19690 B76-10587 08

**PREVENTION**

- Remote moisture-content balance  
ARC-11032 B76-10492 03

**PRINTED CIRCUITS**

- Printed-circuit solar-cell array  
M-FS-23128 B76-10007 01  
Guidelines for multiple LSI packaging  
M-FS-23367 B76-10159 01  
Multiple-layer printed-wiring trace connector  
LANGLEY-11709 B76-10305 01  
Mask analysis program  
M-FS-23431 B76-10318 01  
Reduced costs for solar-cell modules  
LEWIS-12185 B76-10427 08  
Elimination of thermally generated EMF's on PC boards  
MSC-16125 B76-10594 08

**PRINTING**

- Contrast enhancement of transparencies  
GSFC-11989 B76-10181 03

**PROBABILITY THEORY**

- Estimation of spares  
MSC-19469 B76-10133 09  
Design of redundant systems  
MSC-16026 B76-10383 06

**PROCEEDINGS**

- Terrestrial photovoltaic measurements workshop  
LEWIS-12643 B76-10350 03

**PRODUCT DEVELOPMENT**

- Transformer design tradeoffs  
NPO-13755 B76-10470 01

**PRODUCTION**

- Connector contact-ring bus  
MSC-19480 B76-10146 01  
Machining titanium alloys  
M-FS-23006 B76-10283 08

**PRODUCTION ENGINEERING**

- Manufacture of flat-conductor cable  
M-FS-23121 B76-10155 01  
Transformer design tradeoffs  
NPO-13755 B76-10470 01

- Nondestructive interior examination of moving parts  
M-FS-23378 B76-10545 06

**PRODUCTION MANAGEMENT**

- Learning/cost-improvement curves  
M-FS-23429 B76-10287 09

**PROFILOMETERS**

- Optical profilometer  
LANGLEY-11869 B76-10338 03

**PROJECTIVE GEOMETRY**

- Oblique orthographic projections and contour plots  
LANGLEY-11877 B76-10601 09

**PROPAGATION VELOCITY**

- Effects of mismatch on group delay of microwave transmission  
NPO-13863 B76-10478 02

**PROPELLANT PROPERTIES**

- Propellant side feed  
LANGLEY-11082 B76-10094 06

**PROPELLANT TESTS**

- Propellant side feed  
LANGLEY-11082 B76-10094 06

**PROSTHETIC DEVICES**

- Graphite-reinforced bone cement  
NPO-13764 B76-10211 05  
An artificial leg for hip disarticulation  
ARC-10916 B76-10541 05

**PROTECTIVE COATINGS**

- Improved microbridge Josephson devices  
M-FS-23274 B76-10012 01  
Transparent and flame-retardant potting compounds  
MSC-14669 B76-10066 04  
Specific-ion electrodes for measuring Ag ions  
MSC-14906 B76-10068 04  
Abrasion-resistant coatings for plastic surfaces  
ARC-10915 B76-10201 04  
Vapor corrosion inhibitors  
M-FS-19232 B76-10206 04  
Flame-resistant elastomeric polymers  
MSC-16078 B76-10357 04  
Parylene coating for circuit components  
M-FS-23450 B76-10583 08

**PROTON IRRADIATION**

- Proton tissue dose  
LANGLEY-11802 B76-10078 05

**PSEUDONOISE**

- PN ranging/telemetry transmission  
GSFC-12017 B76-10323 02  
All-digital sequence correlator  
NPO-13737 B76-10468 01

**PSYCHROMETERS**

- Relative humidity from psychrometric data  
FRC-10108 B76-10285 09  
Quartz-crystal-oscillator hygrometer  
GSFC-12153 B76-10349 03

**PUBLIC ADDRESS SYSTEMS**

- Oral annunciator with programmable vocabulary  
MSC-14798 B76-10326 02

**PULSE AMPLITUDE**

- Pulse amplitude discriminator threshold calibration  
GSFC-11912 B76-10023 02

**PULSE CODE MODULATION**

- Unbalanced quadrature demodulator  
MSC-14840 B76-10161 02  
Flexible high-speed instrumentation system  
FRC-10110 B76-10483 02

**PULSE COMMUNICATION**

- Long binary frame sync words  
NPO-13727 B76-10163 02  
Doppler extraction with a digital VCO  
MSC-14814 B76-10452 01

**PULSE FREQUENCY MODULATION**

- Digital varying-frequency generator  
MSC-16331 B76-10446 01

**PULSED LASERS**

- Two-wavelength dye laser  
LANGLEY-12012 B76-10170 03  
Stabilized Nd YAG laser output  
GSFC-11571 B76-10335 03  
Efficient copper-vapor pulsed laser  
NPO-13449 B76-10341 03  
Spatially-coherent coupled semiconductor lasers  
M-FS-23396 B76-10500 03  
Spatial filter for Q-switched laser  
LEWIS-12164 B76-10501 03

**PUMPS**

- Atmosphere-generating system  
MSC-14713 B76-10389 06  
Cavitating performance of pumping machinery  
LEWIS-12423 B76-10394 06  
Low-pressure-gas sampling pump  
ARC-10941 B76-10573 07

**PUSH-PULL AMPLIFIERS**

- Deflection amplifier for image dissectors  
NPO-13079 B76-10449 01

**PYROLYSIS**

- Determining total carbon in hydrazine  
KSC-11022 B76-10521 04

**PYROLYTIC MATERIALS**

- Improved high-temperature heater with stabilized-zirconia elements  
M-FS-23351 B76-10221 06

**PROPHORIC MATERIALS**

- Flame-resistant elastomeric polymers  
MSC-16078 B76-10357 04

**Q****Q FACTORS**

- Reduction of acoustic losses by outgassing  
MSC-15985 B76-10069 04

**Q SWITCHED LASERS**

- Spatial filter for Q-switched laser  
LEWIS-12164 B76-10501 03

**QUALITY CONTROL**

- Pressure tube instrumentation  
LEWIS-12539 B76-10101 06  
Uniform solar cells  
GSFC-11941 B76-10125 08  
Computer-automated ultrasonic inspection system  
M-FS-23338 B76-10217 06  
Simplified explosive-weld evaluation  
MSC-14654 B76-10228 06  
Overhead tray for cable test system  
MSC-19488 B76-10270 08  
Fracture mechanics for weld acceptance  
M-FS-23360 B76-10282 08  
Graphical methods for variable sampling plans  
MSC-19279 B76-10431 08  
Nondestructive interior examination of moving parts  
M-FS-23378 B76-10545 06

Ultrasonic monitoring of crack extension  
LEWIS-12632 876-10547 06  
Elastrostatic-discharge damage to semiconductors  
LANGLEY-11739 876-10586 08

**QUANTITATIVE ANALYSIS**

Determination of trace amounts of POF3  
LEWIS-10577 876-10356 04  
Determining total carbon in hydrazine  
KSC-11022 876-10521 04

**QUARTZ LAMPS**

High-temperature heating array  
MSC-14287 876-10251 07

**QUARTZ TRANSDUCERS**

Quartz-crystal-oscillator hygrometer  
GSFC-12153 876-10349 03

**R****RACKS (FRAMES)**

Improved shelf for electronic modules  
NPO-13158 876-10578 07

**RADAR ANTENNAS**

Duplexer switch  
LANGLEY-11546 876-10448 01  
Low-cost dual-frequency microwave antenna  
MSC-16100 876-10462 01  
Multifrequency broadband dual-polarized antenna  
NPO-13866 876-10464 01

**RADAR CORNER REFLECTORS**

Thermal/vacuum testing of laser corner-cube retroreflectors  
M-FS-23565 876-10549 06

**RADAR TRACKING**

Signal enhancement filters  
MSC-14907 876-10453 01

**RADIATION ABSORPTION**

Determination of trace amounts of POF3  
LEWIS-10577 876-10356 04  
Differential-optoacoustic absorption detector  
NPO-13759 876-10494 03

**RADIATION COUNTERS**

Pulse amplitude discriminator threshold calibration  
GSFC-11912 876-10023 02

**RADIATION DETECTORS**

Improved collimator for imaging system  
M-FS-22863 876-10038 03  
Two-dimensional photon detector  
M-FS-23325 876-10048 03  
Microchannel detector array for X-rays and UV  
M-FS-23324 876-10053 03  
Measurement of rapidly-changing heating rates  
LANGLEY-11380 876-10097 06  
Uniform solar cells  
GSFC-11941 876-10125 08  
Pyroionic infrared detector  
LANGLEY-11921 876-10204 04

**RADIATION DISTRIBUTION**

Field distribution in a thin lens  
LANGLEY-11392 876-10179 03

**RADIATION HAZARDS**

Safety organizations and experts  
LEWIS-12742 876-10598 09

**RADIATION MEASURING INSTRUMENTS**

Ultraviolet fire detector  
M-FS-21577 876-10016 02  
Measurement of rapidly-changing heating rates  
LANGLEY-11380 876-10097 06  
Self-calibrating radiometer  
ARC-10811 876-10339 03  
Temperature reference for microwave radiometer calibration  
LANGLEY-11355 876-10503 03

**RADIATION PYROMETERS**

Temperature reference for microwave radiometer calibration  
LANGLEY-11355 876-10503 03

**RADIATION SHIELDING**

Proton tissue dose  
LANGLEY-11802 876-10078 05

**RADIATION SOURCES**

Calibration source for sensitive optical detectors  
LANGLEY-11625 876-10036 03

**RADIATIVE HEAT TRANSFER**

Resistance heating elements with specific heating profiles  
LEWIS-10719 876-10095 06  
Measurement of rapidly-changing heating rates  
LANGLEY-11380 876-10097 06  
Solar thermal energy utilization A bibliography with abstracts  
HQN-10900 876-10186 03  
Heat pipe technology  
HQN-10901 876-10233 06  
Thermal network modeling handbook  
MSC-14964 876-10236 06  
Improved solar-energy collector  
NPO-13813 876-10486 03

**RADICALS**

Counting digital filter  
NPO-11821 876-10296 01

**RADIO ALTIMETERS**

Low-cost pressure-data encoder  
NPO-13692 876-10303 01

**RADIO FREQUENCY IMPEDANCE PROBES**

Nondestructive inspection of multilayered insulation  
M-FS-22191 876-10128 08

**RADIO FREQUENCY SHIELDING**

Wideband distribution amplifier  
NPO-13256 876-10307 01

**RADIO TRANSMISSION**

A linear phase demodulator  
GSFC-12018 876-10291 01

**RADIO TRANSMITTERS**

Tracking system for moving subjects  
HQN-10880 876-10028 02

**RADIOGRAPHY**

Shadow mask for X-ray spectrometer  
GSFC-12131 876-10348 03  
Image intensification of developed photographs  
M-FS-23461 876-10495 03

**RADIOMETERS**

Self-calibrating radiometer  
ARC-10811 876-10339 03  
Portable solar radiometer measures stack-plume effluents  
LANGLEY-12123 876-10491 03  
Temperature reference for microwave radiometer calibration  
LANGLEY-11355 876-10503 03

**RAMP FUNCTIONS**

Signal enhancement filters  
MSC-14907 876-10453 01

**RANDOM NOISE**

Design of redundant systems  
MSC-16026 876-10383 06

**RANDOM PROCESSES**

Multivariate normal integration  
M-FS-22867 876-10288 09

**RANDOM VIBRATION**

Peak-acceleration limiter  
NPO-11940 876-10082 06

**RANGE (EXTREMES)**

Control system design  
LEWIS-12556 876-10404 06

**RANGE FINDERS**

Video display synthesizer  
MSC-14620 876-10052 03

**RANGEFINDING**

Laser-Doppler measurement of air turbulence  
M-FS-23155 876-10031 03

**RANKINE CYCLE**

Solar heating and cooling performance  
M-FS-23432 876-10235 06

**RATIOMETERS**

Direct-reading inductance meter  
NPO-13792 876-10473 02

**REACTION KINETICS**

Rapid kinetics  
LANGLEY-12140 876-10529 04

**READOUT**

Readout method for stored information  
NPO-13243 876-10029 02

**REAL TIME OPERATION**

Microprogramming for real-time data acquisition  
KSC-11027 876-10328 02

**RECEIVERS**

Receiver performance evaluator  
NPO-13701 876-10324 02  
Capacitively-coupled data receiver clipper stage  
MSC-14989 876-10456 01

**RECEPTION DIVERSITY**

Subcarrier signal combiner for arrayed antennas  
NPO-13723 876-10329 02

**RECORDING INSTRUMENTS**

A/D converter  
LANGLEY-11319 876-10009 01  
Two-dimensional photon detector  
M-FS-23325 876-10048 03  
Remote water-monitoring system  
LANGLEY-11973 876-10365 05

**REDUCTION (CHEMISTRY)**

REDOX - electrochemical energy storage  
LEWIS-12220 876-10070 04  
Electrolyte cells measure oxygen fugacities  
MSC-16089 876-10523 04

**REELS**

Recording-tape position sensor  
GSFC-12056 876-10577 07

**REENTRY**

Impact of a solid body with water  
M-FS-23512 876-10560 06

**REFLECTANCE**

Measurement of transient reflectance  
M-FS-23160 876-10037 03  
Low-reflectivity spectrally selective coating  
GSFC-12114 876-10184 03

**REFLECTOMETERS**

Measurement of transient reflectance  
M-FS-23160 876-10037 03  
Vacuum-ultraviolet reflectometer  
MSC-14995 876-10336 03

- Time-domain reflectometry for cable-fault isolation  
KSC-10741 876-10377 06
- REFLECTORS**  
Thermal/vacuum testing of laser corner-cube retroreflectors  
M-FS-23565 876-10549 06
- REFRACTORY MATERIALS**  
Thermal fatigue-and-oxidation-resistant alloy  
LEWIS-12564 876-10061 04  
Coatings for mullite insulation  
LANGLEY-11150 876-10067 04  
High-temperature heating array  
MSC-14287 876-10251 07  
Enamel for high-temperature superalloys  
M-FS-22804 876-10358 04
- REFRACTORY METALS**  
Containerless processing of tungsten  
M-FS-23509 876-10422 08
- REFRIGERATORS**  
Sublimator/evaporator heat sink  
ARC-10912 876-10384 06
- REGISTERS (COMPUTERS)**  
Hybrid digital-analog implementation of digital filters  
NPO-11833 876-10299 01  
Continuous-data FIFO bubble shift register  
LANGLEY-11862 876-10443 01
- REINFORCEMENT (STRUCTURES)**  
Cost saving synergistic shaft seal  
LEWIS-12119 876-10081 06  
Modular multipurpose panel support  
MSC-19641 876-10421 08
- REINFORCING FIBERS**  
Composite laminate warpape  
LEWIS-12615 876-10355 04  
Second-generation PMR polyimides  
LEWIS-12738 876-10359 04
- RELIABILITY**  
Prevention of design flaws in multicomputer systems  
MSC-14920 876-10330 02  
Input/output error analyzer  
GSFC-12132 876-10610 09
- RELIABILITY ENGINEERING**  
Pulse detector  
MSC-16268 876-10557 06  
Electrostatic-discharge damage to semiconductors  
LANGLEY-11739 876-10586 08
- REMOTE CONSOLES**  
Remote access of modem by digital control  
GSFC-11943 876-10022 02
- REMOTE CONTROL**  
Load-regulating latch  
MSC-19535 876-10252 07
- REMOTE HANDLING**  
Selective image enhancement  
M-FS-23364 876-10021 02  
Concentric-tube differential drive  
M-FS-22707 876-10114 07  
Infrared range sensor  
ARC-10885 876-10475 02
- REMOTE SENSORS**  
Light pipes for LED measurements  
GSFC-11887 876-10034 03  
Remote sensing of natural resources  
HQN-10899 876-10238 06  
Remote water-monitoring system  
LANGLEY-11973 876-10365 05  
Remote sensing of vegetation and soil  
GSFC-11976 876-10490 03
- Remote moisture-content balance  
ARC-11032 876-10492 03  
Miniature-angular-position transducer  
LANGLEY-11999 876-10555 06  
CAMSP Classification and Mensuration Software Package  
MSC-14979 876-10600 09
- REPLACING**  
Jet engine stator-blade removal tool  
MSC-16000 876-10420 07
- REPORTS**  
Flat-conductor cable baseboard  
M-FS-23141 876-10154 01  
Manufacture of flat-conductor cable  
M-FS-23121 876-10155 01  
Installation of surface-mounted flat-conductor cable  
M-FS-23266 876-10158 01  
Vapor corrosion inhibitors  
M-FS-19232 876-10206 04  
Annealing strained alloy 718  
M-FS-19242 876-10284 08
- RESCUE OPERATIONS**  
Multiposition rescue litter  
MSC-16148 876-10368 05
- RESIDUES**  
Manual trash compactor  
MSC-16039 876-10390 06
- RESISTANCE HEATING**  
Resistance heating elements with specific heating profiles  
LEWIS-10719 876-10095 06
- RESOLUTION**  
Contrast enhancement of transparencies  
GSFC-11989 876-10181 03
- RESONANCE TESTING**  
Pump failure monitor  
M-FS-23366 876-10219 06
- RESONANT VIBRATION**  
Rous system  
LANGLEY-12015 876-10215 06
- RESONATORS**  
Band-elimination filter  
M-FS-23303 876-10295 01
- RETICLES**  
Visual projection reticle  
ARC-10976 876-10590 08
- RETROREFLECTION**  
Improved interferometer beam splitter  
NPO-11932 876-10041 03  
Thermal/vacuum testing of laser corner-cube retroreflectors  
M-FS-23565 876-10549 06
- REYNOLDS EQUATION**  
Swept wing aerodynamics  
ARC-10790 876-10403 06
- REYNOLDS NUMBER**  
Hot-wire probe  
ARC-10900 876-10222 06
- RIBBONS**  
RF shaping of silicon ribbon  
M-FS-23424 876-10258 08
- RICCATI EQUATION**  
Linear stochastic optimal control and estimation  
LEWIS-12505 876-10134 09  
Linear stochastic optimal control and estimation  
LEWIS-12540 876-10607 09
- RING STRUCTURES**  
Connector contact-ring bus  
MSC-19480 876-10146 01
- RISK**  
Estimation of spares  
MSC-19469 876-10133 09
- RL CIRCUITS**  
Composite stacked moly-permalloy cores  
NPO-13578 876-10294 01
- ROCKET EXHAUST**  
Atmospheric particle sampler  
NPO-13396 876-10059 04  
Thermal-radiation model  
M-FS-23538 876-10562 06
- ROCKET THRUST**  
Propellant side feed  
LANGLEY-11082 876-10094 06
- ROLL FORMING**  
Roll-forming tubes to header plates  
LEWIS-10513 876-10130 08
- ROLLERS**  
Heavy-duty mechanical sequencer  
MSC-19536 876-10418 07
- ROLLING**  
Metalworking method for composites  
M-FS-23354 876-10132 08
- ROLLING CONTACT LOADS**  
Vehicle load-equalization system  
MSC-12466 876-10249 07
- ROTATING CYLINDERS**  
Concentric-tube differential drive  
M-FS-22707 876-10114 07
- ROTATING GENERATORS**  
Low-voltage motor heater  
KSC-10651 876-10304 01  
Astronautic structures manual  
M-FS-23547 876-10393 06
- ROTOR SPEED**  
Miniature-angular-position transducer  
LANGLEY-11999 876-10555 06
- ROTORS**  
Predicting off-design performance of radial-inflow turbines  
LEWIS-12500 876-10242 06
- RUBBER COATINGS**  
Flame-resistant elastomeric polymers  
MSC-16078 876-10357 04
- RUBY LASERS**  
Spatial filter for Q-switched laser  
LEWIS-12164 876-10501 03
- RUNGE-KUTTA METHOD**  
Active optics simulation system  
LANGLEY-12104 876-10512 03
- RUNWAY ALIGNMENT**  
Crosswind landing-gear position indicator  
LANGLEY-11941 876-10120 07
- RUSTING**  
Vapor corrosion inhibitors  
M-FS-19232 876-10206 04
- RUTHENIUM COMPOUNDS**  
Catalytic oxidation of waste materials  
MSC-14831 876-10354 04

## S

## SAFETY

- Safety organizations and experts  
LEWIS-12742 876-10598 09
- SAFETY DEVICES**  
Increased safety in mercury-containing devices  
M-FS-23308 876-10013 01  
Automatic fire/weather data station  
ARC-10993 876-10160 02  
Compressed air cylinder pallet  
MSC-19217 876-10203 04  
Overload-protector/fault-indicator circuit  
NPO-13592 876-10308 01



- Majority-voted logic fail-sense circuit  
NPO-13107 B76-10313 01  
Inexpensive low-voltage solid-state alarm  
LEWIS-12544 B76-10320 02  
Safety brake for tape reels  
GSFC-11960 B76-10412 07  
NASA technology utilization house  
LANGLEY-12134 B76-10570 07
- SAMPLERS**  
Atmospheric particle sampler  
NPO-13396 B76-10059 04  
Portable wind sensitive directional air sampler  
LEWIS-12743 B76-10489 03
- SAMPLING**  
Field sampling fine-vacuum system  
KSC-10596 B76-10118 07  
Graphical methods for variable sampling plans  
MSC-19279 B76-10431 08
- SANDWICH STRUCTURES**  
3-D foam adhesive deposition  
M-FS-22739 B76-10271 08
- SANITATION**  
NASA technology utilization house  
LANGLEY-12134 B76-10570 07
- SAPPHIRE**  
Improved Einzel lenses  
M-FS-23115 B76-10032 03
- SATELLITE ANTENNAS**  
Active retrodirective antenna  
NPO-13641 B76-10463 01
- SATELLITE ORBITS**  
SANDTRACKS World map and stations predictions computer programs  
GSFC-12099 B76-10190 03
- SATELLITE TRACKING**  
SANDTRACKS World map and stations predictions computer programs  
GSFC-12099 B76-10190 03
- SATURABLE REACTORS**  
Fluorescent dimming ballast  
MSC-14937 B76-10292 01
- SCALERS**  
M-ary shift register  
NPO-11868 B76-10011 01
- SCANNERS**  
Readout method for stored information  
NPO-13243 B76-10029 02  
Photorefractive page composer  
M-FS-23419 B76-10171 03
- SCATTERING**  
Beam splitter/combiner  
GSFC-12083 B76-10177 03
- SCATTEROMETERS**  
Measuring scatter angle from mirrors  
M-FS-23421 B76-10342 03
- SCHEDULING**  
DORCA II Dynamic operations requirements and cost analysis program  
HQN-10834 B76-10289 09
- SCRAP**  
Manual trash compactor  
MSC-16039 B76-10390 06
- SEA ICE**  
All-weather ice information system  
LEWIS-12638 B76-10018 02
- SEALERS**  
Flexible-pile thermal sealant  
MSC-19568 B76-10371 06  
Hydrodynamic lubrication of face seals  
LEWIS-12710 B76-10558 06
- SEALING**  
Roll-forming tubes to header plates  
LEWIS-10513 B76-10130 08
- Leak testing glass ampoules  
LANGLEY-11988 B76-10551 06
- SEALS (STOPPERS)**  
Hydrostatic lift-off seal  
M-FS-21496 B76-10079 06  
Improved cryogenic shaft seals  
M-FS-19153 B76-10080 06  
Cost saving synergistic shaft seal  
LEWIS-12119 B76-10081 06  
Split-ring seal  
MSC-14304 B76-10247 07  
Fraction collector for electrophoresis  
M-FS-23459 B76-10352 04  
Fundamentals of fluid sealing  
LEWIS-12683 B76-10392 06
- SEARCH PROFILES**  
Business capabilities file  
NPO-13834 B76-10136 09  
Library information retrieval system  
NPO-14017 B76-10599 09
- SEATS**  
Viscoelastic foam cushion  
ARC-11089 B76-10525 04
- SEEBECK EFFECT**  
Elimination of thermally generated EMF's on PC boards  
MSC-16125 B76-10594 08
- SELECTIVITY**  
Band-elimination filter  
M-FS-23303 B76-10295 01
- SELF ALIGNMENT**  
Servo corrects interferometer-mirror tilt  
NPO-13687 B76-10502 03
- SEMICONDUCTING FILMS**  
Improved microbridge Josephson devices  
M-FS-23274 B76-10012 01
- SEMICONDUCTOR DEVICES**  
Optical bias assembly  
MSC-14412 B76-10051 03  
Power-control switch  
M-FS-23395 B76-10148 01  
Faster X-ray analysis of semiconductor wafers  
M-FS-23315 B76-10225 06  
Multiple-bubble detector  
LANGLEY-12043 B76-10444 01  
Semiconductor ohmic contact  
LANGLEY-11691 B76-10461 01  
Electrostatic analysis of charge-coupled structures  
M-FS-23507 B76-10472 01  
Elastrostatic-discharge damage to semiconductors  
LANGLEY-11739 B76-10586 08
- SEMICONDUCTOR LASERS**  
Pulse transformer for GaAs laser  
M-FS-23399 B76-10185 03  
Crystal orientation for solid-state photolithography  
LANGLEY-11940 B76-10582 08
- SEMICONDUCTORS (MATERIALS)**  
RF shaping of silicon ribbon  
M-FS-23424 B76-10258 08  
IGFET/SOI fabrication method  
M-FS-23312 B76-10259 08
- SENSITIVITY**  
Optimal insensitive-controller synthesis  
M-FS-21666 B76-10103 06
- SENSORS**  
Sensor for analog speed controls  
LEWIS-12597 B76-10020 02  
Flexible high-speed instrumentation system  
FRC-10110 B76-10483 02
- SENSORY PERCEPTION**  
Measuring mandibular motions  
ARC-10956 B76-10362 05
- SEPARATION**  
Stripper for silicone polymers  
MSC-19380 B76-10267 08
- SEPARATORS**  
Fluid classifier and disseminator  
HQN-10748 B76-10089 06  
Integral fan/water separator  
MSC-14756 B76-10119 07  
Automated solvent concentrator  
NPO-13068 B76-10198 04  
Precolumn for extract concentration  
NPO-13083 B76-10199 04
- SEQUENTIAL CONTROL**  
Heavy-duty mechanical sequencer  
MSC-19536 B76-10418 07
- SERVICE LIFE**  
Chemiluminescent prediction of service life  
MSC-16010 B76-10191 04  
Repair of fused silica platens  
MSC-19713 B76-10276 08
- SERVOCONTROL**  
Stepping optical path difference in an interferometer  
NPO-13569 B76-10033 03
- SERVOMOTORS**  
Ironless-armature brushless motor  
GSFC-11880 B76-10476 02
- SEWAGE**  
Catalytic oxidation of waste materials  
MSC-14831 B76-10354 04  
Less-costly activated carbon for sewage treatment  
NPO-13877 B76-10516 04
- SHAFTS (MACHINE ELEMENTS)**  
Hydrostatic lift-off seal  
M-FS-21496 B76-10079 06  
Improved cryogenic shaft seals  
M-FS-19153 B76-10080 06  
Cable-load equalization system  
MSC-17494 B76-10230 06  
Split-ring seal  
MSC-14304 B76-10247 07
- SHAKERS**  
Fail-safe hydraulic shaker protection  
NPO-13726 B76-10218 06
- SHAPERS**  
Roll-forming tubes to header plates  
LEWIS-10513 B76-10130 08
- SHEAR PROPERTIES**  
Analysis of bonded joints  
LANGLEY-11871 B76-10231 06  
Dynamic load attenuator  
MSC-17472 B76-10416 07
- SHEAR STRESS**  
Analysis of bonded joints  
LANGLEY-11871 B76-10231 06
- SHELL STABILITY**  
Analysis of axisymmetric shell structure  
LANGLEY-12059 B76-10398 06  
Energy-absorbing attenuator  
MSC-17473 B76-10419 07  
General instability analysis  
M-FS-23407 B76-10563 06
- SHELLS (STRUCTURAL FORMS)**  
Analysis of axisymmetric shell structure  
LANGLEY-12059 B76-10398 06
- SHIFT REGISTERS**  
Control logic for successive-approximation A/D converters  
NPO-11937 B76-10010 01  
M-ary shift register  
NPO-11868 B76-10011 01

- Hybrid digital-analog implementation of digital filters  
NPO-11833 B76-10299 01  
Concatenated algebraic decoder  
MSC-14058 B76-10325 02  
Electrostatic analysis of charge-coupled structures  
M-FS-23507 B76-10472 01
- SHOCK ABSORBERS**  
Nomograph for castor-cushion design  
MSC-17094 B76-10229 06  
Vehicle load-equalization system  
MSC-12466 B76-10249 07  
Viscoelastic foam cushion  
ARC-11089 B76-10525 04
- SHOCK TUBES**  
Shock-tube driver  
NPO-13528 B76-10090 06  
Double-exposure holographic interferometer  
NPO-13796 B76-10169 03
- SHOCK WAVE INTERACTION**  
Shock interference patterns and heating  
LANGLEY-11497 B76-10240 06
- SHOCK WAVE PROFILES**  
Analytic numerical solutions for shock waves  
ARC-10959 B76-10096 06
- SHOCK WAVE PROPAGATION**  
Analytic numerical solutions for shock waves  
ARC-10959 B76-10096 06  
Double-exposure holographic interferometer  
NPO-13796 B76-10169 03
- SHOCK WAVES**  
Shock-tube driver  
NPO-13528 B76-10090 06  
Analytic numerical solutions for shock waves  
ARC-10959 B76-10096 06  
Shock interference patterns and heating  
LANGLEY-11497 B76-10240 06
- SHORT CIRCUITS**  
Majority-voted logic fail-sense circuit  
NPO-13107 B76-10313 01
- SHORT TAKEOFF AIRCRAFT**  
Gust alleviation for STOL aircraft  
LANGLEY-11413 B76-10099 06
- SHUTDOWNS**  
Reduction of computer power interruptions  
MSC-16136 B76-10479 02
- SIGNAL ANALYSIS**  
Computer-automated ultrasonic inspection system  
M-FS-23338 B76-10217 06
- SIGNAL DETECTION**  
Bit-error rates in optical communications  
M-FS-23340 B76-10286 09  
Hologram-reconstruction signal enhancement  
M-FS-23104 B76-10343 03  
Capacitively-coupled data receiver clipper stage  
MSC-14989 B76-10456 01
- SIGNAL DETECTORS**  
Unbalanced quadruphase demodulator  
MSC-14840 B76-10161 02  
Signal level detector  
NPO-13272 B76-10310 01
- SIGNAL ENCODING**  
Serial-data correlator/code translator  
KSC-11025 B76-10454 01
- SIGNAL MEASUREMENT**  
Instrumentation for measuring low-level currents/voltages  
MSC-14855 B76-10480 02
- SIGNAL PROCESSING**  
DC-to-DC conversion with voltage multipliers  
LEWIS-12297 B76-10138 01  
PN ranging/telemetry transmission  
GSFC-12017 B76-10323 02  
Signal processing and display for electrochemical data  
LANGLEY-11922 B76-10327 02  
Subcarrier signal combiner for arrayed antennas  
NPO-13723 B76-10329 02  
Flexible high-speed instrumentation system  
FRC-10110 B76-10483 02
- SIGNAL RECEPTION**  
Instrumentation for measuring low-level currents/voltages  
MSC-14855 B76-10480 02
- SIGNAL TO NOISE RATIOS**  
Receiver performance evaluator  
NPO-13701 B76-10324 02  
Subcarrier signal combiner for arrayed antennas  
NPO-13723 B76-10329 02  
Shadow mask for X-ray spectrometer  
GSFC-12131 B76-10348 03  
Fabrication of ultra-low-noise amplifier  
GSFC-12186 B76-10596 08
- SILICON**  
RF shaping of silicon ribbon  
M-FS-23424 B76-10258 08
- SILICON RADIATION DETECTORS**  
Solid-state particle detectors  
GSFC-11785 B76-10142 01
- SILICONE RESINS**  
Low-pressure low-temperature molding process  
MSC-19778 B76-10425 08
- SINE WAVES**  
Low-frequency sine wave hard-limiting technique  
NPO-13230 B76-10309 01
- SIZE DETERMINATION**  
Electrical-conduit sizing gage  
MSC-19491 B76-10150 01  
Precision measurement of changes in physical dimensions  
M-FS-23527 B76-10543 06
- SKIN (STRUCTURAL MEMBER)**  
General instability analysis  
M-FS-23407 B76-10563 06
- SLICING**  
Hot-wire tile removal tool  
KSC-11043 B76-10433 08
- SLOT ANTENNAS**  
Low-cost dual-frequency microwave antenna  
MSC-16100 B76-10462 01
- SLUDGE**  
Catalytic oxidation of waste materials  
MSC-14831 B76-10354 04  
Less-costly activated carbon for sewage treatment  
NPO-13877 B76-10516 04
- SMALL PERTURBATION FLOW**  
Introducing controlled matter into a fluid system  
M-FS-24309 B76-10093 06
- SMOKE ABATEMENT**  
Flame-resistant elastomeric polymers  
MSC-16078 B76-10357 04
- SMOKE TRAILS**  
Wingtip smoke generator  
ARC-10905 B76-10373 06
- SOILS**  
Remote sensing of vegetation and soil  
GSFC-11976 B76-10490 03
- SOLAR ARRAYS**  
Improved solar-energy collector  
NPO-13813 B76-10486 03  
Economical solar-heating for homes  
LANGLEY-12135 B76-10571 07
- SOLAR CELLS**  
Printed-circuit solar-cell array  
M-FS-23128 B76-10007 01  
Solar selective surfaces  
LEWIS-12614 B76-10047 03  
JPL solar power experiments  
NPO-13461 B76-10098 06  
Uniform solar cells  
GSFC-11941 B76-10125 08  
Solar cell electrical connections  
LEWIS-12293 B76-10260 08  
Terrestrial photovoltaic measurements workshop  
LEWIS-12643 B76-10350 03  
Reduced costs for solar-cell modules  
LEWIS-12185 B76-10427 08  
Universal solar-cell terminal  
M-FS-23505 B76-10450 01
- SOLAR COLLECTORS**  
Solar selective surfaces  
LEWIS-12614 B76-10047 03  
JPL solar power experiments  
NPO-13461 B76-10098 06  
Faceted solar energy collectors  
MSC-12687 B76-10182 03  
Solar thermal energy utilization A bibliography with abstracts  
HQN-10900 B76-10186 03  
Coating for solar panels  
M-FS-23420 B76-10196 04  
Solar concentrator/absorber  
M-FS-23428 B76-10253 07  
Horizontally-mounted solar collector  
M-FS-23349 B76-10256 07  
Solar heated and cooled office building  
LEWIS-12512 B76-10395 06  
Improved solar-energy collector  
NPO-13813 B76-10486 03  
Economical solar-heating for homes  
LANGLEY-12135 B76-10571 07
- SOLAR ENERGY**  
Printed-circuit solar-cell array  
M-FS-23128 B76-10007 01  
SESOP Program for solar-energy heating-systems analysis  
MSC-14853 B76-10113 06  
Faceted solar energy collectors  
MSC-12687 B76-10182 03  
Solar thermal energy utilization A bibliography with abstracts  
HQN-10900 B76-10186 03  
Proposed low-temperature solar engine  
M-FS-23403 B76-10254 07  
Improved solar-energy collector  
NPO-13813 B76-10486 03
- SOLAR ENERGY ABSORBERS**  
Solar selective surfaces  
LEWIS-12614 B76-10047 03  
JPL solar power experiments  
NPO-13461 B76-10098 06  
Coating for solar panels  
M-FS-23420 B76-10196 04  
Solar concentrator/absorber  
M-FS-23428 B76-10253 07  
Horizontally-mounted solar collector  
M-FS-23349 B76-10256 07

- Universal solar-cell terminal  
M-FS-23505 876-10450 01  
Improved solar-energy collector  
NPO-13813 876-10486 03
- SOLAR ENERGY CONVERSION**  
Solar heating and cooling performance  
M-FS-23432 876-10235 06  
Solar concentrator/absorber  
M-FS-23428 876-10253 07  
Horizontally-mounted solar collector  
M-FS-23349 876-10256 07
- SOLAR FLUX**  
Terrestrial photovoltaic measurements workshop  
LEWIS-12643 876-10350 03
- SOLAR GENERATORS**  
JPL solar power experiments  
NPO-13461 876-10098 06  
Faceted solar energy collectors  
MSC-12687 876-10182 03  
Proposed low-temperature solar engine  
M-FS-23403 876-10254 07
- SOLAR HEATING**  
Solar heating and cooling performance  
M-FS-23432 876-10235 06  
Solar heated and cooled office building  
LEWIS-12512 876-10395 06  
NASA technology utilization house  
LANGLEY-12134 876-10570 07  
Economical solar-heating for homes  
LANGLEY-12135 876-10571 07
- SOLAR ORBITS**  
Development ephemeris number 96  
NPO-14002 876-10507 03
- SOLAR PHYSICS**  
Development ephemeris number 96  
NPO-14002 876-10507 03
- SOLAR REFLECTORS**  
Low-cost solar reflectors  
NPO-13707 876-10123 08
- SOLAR SIMULATORS**  
Terrestrial photovoltaic measurements workshop  
LEWIS-12643 876-10350 03
- SOLDERED JOINTS**  
Compound solder joints  
LANGLEY-11444 876-10274 08
- SOLDERING**  
Improved soldering iron tip  
M-FS-19349 876-10145 01  
Polishing gold and gold-alloy crystals  
M-FS-22800 876-10263 08
- SOLDERS**  
Improved soldering iron tip  
M-FS-19349 876-10145 01
- SOLID PROPELLANTS**  
Propellant side feed  
LANGLEY-11082 876-10094 06
- SOLID SOLUTIONS**  
Determining eutectic composition in metal alloys  
LEWIS-12633 876-10520 04
- SOLID STATE DEVICES**  
Solid-state particle detectors  
GSFC-11785 876-10142 01  
IGFET/SOI fabrication method  
M-FS-23312 876-10259 08  
Pulse detector  
MSC-16268 876-10557 06  
Electrostatic-discharge damage to semiconductors  
LANGLEY-11739 876-10586 08
- SOLID SURFACES**  
Optical profilometer  
LANGLEY-11869 876-10338 03
- SOLOMON COMPUTERS**  
Concatenated algebraic decoder  
MSC-14058 876-10325 02
- SOLUBILITY**  
Solvent for 1-phenyl-3-pyrazolidone in photography  
GSFC-11992 876-10496 03
- SOLVENT EXTRACTION**  
Automated solvent concentrator  
NPO-13068 876-10198 04  
Precolumn for extract concentration  
NPO-13083 876-10199 04
- SOLVENTS**  
Cleaning large tanks and gas bottles  
MSC-14966 876-10430 09  
Solvent for 1-phenyl-3-pyrazolidone in photography  
GSFC-11992 876-10496 03
- SONIC BOOMS**  
Shock interference patterns and heating  
LANGLEY-11497 876-10240 06
- SORPTION**  
Measuring trace dispersants in gas streams  
ARC-10896 876-10374 06
- SOUND PRESSURE**  
Acoustic-energy shaping of meltable metals  
NPO-13802 876-10423 08  
Acoustic testing of materials  
LANGLEY-11659 876-10550 06
- SOUND PROPAGATION**  
Impedance of curved ducts  
LEWIS-12636 876-10237 06
- SOUND TRANSMISSION**  
Attenuation of sound in ducts with acoustic treatment  
LEWIS-12686 876-10226 06  
Acoustic testing of materials  
LANGLEY-11659 876-10550 06
- SOUND WAVES**  
Impedance of curved ducts  
LEWIS-12636 876-10237 06
- SOURCE PROGRAMS**  
FORTRAN code-evaluation system  
M-FS-23539 876-10604 09
- SPACECRAFT TRAJECTORIES**  
GEODYN Orbital and geodetic parameter estimation  
GSFC-12014 876-10396 06
- SPARE PARTS**  
Estimation of spares  
MSC-19469 876-10133 09
- SPARK PLUGS**  
Electrostatic-discharge ignition  
NPO-13798 876-10487 03
- SPATIAL FILTERING**  
Spatially-coherent coupled semiconductor lasers  
M-FS-23396 876-10500 03  
Spatial filter for Q-switched laser  
LEWIS-12164 876-10501 03
- SPECIFICATIONS**  
Pressure tube instrumentation  
LEWIS-12539 876-10101 06
- SPECTRA**  
Color to black-and-white converter  
MSC-12618 876-10346 03
- SPECTRAL RESOLUTION**  
Improved interferometer beam splitter  
NPO-11932 876-10041 03  
Low-light-level integrating video system  
M-FS-23288 876-10347 03
- SPECTROGRAPHS**  
Inexpensive portable drug detector  
ARC-10633 876-10534 05
- SPECTROMETERS**  
Stepping optical path difference in an interferometer  
NPO-13569 876-10033 03  
Improved interferometer beam splitter  
NPO-11932 876-10041 03  
Optical devices  
HQN-10891 876-10188 03  
Rous system  
LANGLEY-12015 876-10215 06  
Laser particulate spectrometer  
MSC-14969 876-10331 03  
Tunable acoustical optical filter  
NPO-13640 876-10340 03  
Shadow mask for X-ray spectrometer  
GSFC-12131 876-10348 03  
Servo corrects interferometer-mirror tilt  
NPO-13687 876-10502 03
- SPECTROPHOTOMETERS**  
Miniature carbon dioxide sensor  
MSC-16009 876-10344 03  
Portable solar radiometer measures stack-plume effluents  
LANGLEY-12123 876-10491 03
- SPECTROSCOPIC ANALYSIS**  
Determination of trace amounts of POF3  
LEWIS-10577 876-10356 04  
Improved gas-pressure transducer  
ARC-10639 876-10381 06
- SPECTROSCOPY**  
Optics and lasers  
HQN-10893 876-10187 03  
A forward-scatter polarimeter for chemical analysis  
NPO-13756 876-10334 03
- SPECULAR REFLECTION**  
Beam splitter/combiner  
GSFC-12083 876-10177 03  
Low-reflectivity spectrally selective coating  
GSFC-12114 876-10184 03
- SPEECH RECOGNITION**  
Oral annunciator with programmable vocabulary  
MSC-14798 876-10326 02
- SPEED CONTROL**  
Sensor for analog speed controls  
LEWIS-12597 876-10020 02
- SPEED INDICATORS**  
Sensor for analog speed controls  
LEWIS-12597 876-10020 02
- SPHERICAL TANKS**  
Ultra-lightweight pressure vessels  
MSC-14983 876-10266 08
- SPIN STABILIZATION**  
Spin-rate control device  
ARC-10884 876-10417 07
- SPlicing**  
Electrical-splicing connector  
M-FS-24254 876-10300 01
- SPLINE FUNCTIONS**  
Math model of 3-D aircraft configuration  
LANGLEY-12029 876-10400 06  
Curvilinear bicubic-spline-fit interpolation  
LANGLEY-11391 876-10434 09  
Contouring randomly spaced data  
LANGLEY-12044 876-10436 09  
Active optics simulation system  
LANGLEY-12104 876-10512 03
- SPOT WELDS**  
Synchronized backside-weld follower  
M-FS-24454 876-10272 08

**SPRAY NOZZLES**

Mixing ingredients in foam dispenser  
M-FS-20607 B76-10592 08

**SPRAYED COATINGS**

Solventless intumescent coatings  
ARC-10996 B76-10194 04  
Coating for solar panels  
M-FS-23420 B76-10196 04  
Molecular beam generator  
MSC-14996 B76-10353 04

**SPRAYERS**

Molecular beam generator  
MSC-14996 B76-10353 04  
Mixing ingredients in foam dispenser  
M-FS-20607 B76-10592 08

**SPRINGS (ELASTIC)**

Vehicle load-equalization system  
MSC-12466 B76-10249 07  
Indicated mean-effective pressure  
instrument  
LEWIS-12661 B76-10542 06

**SPUTTERING**

Ultra-high-vacuum electrical  
feedthrough  
HQN-10799 B76-10005 01

**STABILITY DERIVATIVES**

Determining aircraft stability and control  
derivatives  
FRC-10109 B76-10402 06

**STABILIZED PLATFORMS**

Leveling apparatus for precision  
instruments  
ARC-10981 B76-10572 07

**STAGNATION FLOW**

Transient thermal analysis of fluid  
systems  
MSC-19502 B76-10401 06

**STAINLESS STEELS**

Combined joining process for dissimilar  
metals A concept  
MSC-19323 B76-10127 08  
Diffusion brazing nickel-plated stainless  
steel  
MSC-19322 B76-10265 08  
Braze/Rebraze process for CRES steel  
MSC-19600 B76-10280 08  
Stress-corrosion cracking due to  
hydrazine  
ARC-11093 B76-10526 04

**STANDARDIZATION**

Pressure tube instrumentation  
LEWIS-12539 B76-10101 06

**STANDARDS**

Flat-conductor cable baseboard  
M-FS-23141 B76-10154 01  
Manufacture of flat-conductor cable  
M-FS-23121 B76-10155 01  
Installation of surface-mounted  
flat-conductor cable  
M-FS-23266 B76-10158 01

**STAR TRACKERS**

Anamorphic lens for tracking system  
NPO-13062 B76-10046 03  
Improved resolution for sensor arrays  
NPO-13745 B76-10439 01

**STATE VECTORS**

Processing equations for state-space  
models  
LEWIS-12555 B76-10438 09

**STATIC STABILITY**

Analysis of axisymmetric shell structure  
LANGLEY-12059 B76-10398 06

**STATISTICAL ANALYSIS**

Peak-acceleration limiter  
NPO-11940 B76-10082 06  
Multivariate normal integration  
M-FS-22867 B76-10288 09

Design of redundant systems  
MSC-16026 B76-10383 06  
Astronautic structures manual  
M-FS-23547 B76-10393 06  
Transfer-function parameters  
LEWIS-12612 B76-10605 09  
Linear stochastic optimal control and  
estimation  
LEWIS-12540 B76-10607 09

**STATISTICAL DISTRIBUTIONS**

Math model of 3-D aircraft  
configuration  
LANGLEY-12029 B76-10400 06

**STATISTICS**

Birth/death process model  
NPO-13616 B76-10213 05

**STATOR BLADES**

Jet engine stator-blade removal tool  
MSC-16000 B76-10420 07

**STATORS**

Predicting off-design performance of  
radial-inflow turbines  
LEWIS-12500 B76-10242 06  
Ironless-armature brushless motor  
GSFC-11880 B76-10476 02

**STEEL STRUCTURES**

Stress-corrosion cracking due to  
hydrazine  
ARC-11093 B76-10526 04

**STEELS**

Large-diameter fasteners of CRES alloy  
MSC-19313 B76-10250 07  
Cleaning carbon steel  
KSC-10689 B76-10275 08

**STEREOTELEVISION**

Video display synthesizer  
MSC-14620 B76-10052 03

**STIFFNESS**

Relative stiffness of flat-conductor  
cable  
M-FS-23537 B76-10469 01

**STIFFNESS MATRIX**

General instability analysis  
M-FS-23407 B76-10563 06

**STIMULATED EMISSION DEVICES**

Beam patterns of light-emitting diodes  
GSFC-11890 B76-10040 03  
Determination of radiative current in  
LEDs  
GSFC-12034 B76-10042 03  
Beam splitter/combiner  
GSFC-12083 B76-10177 03

**STOCHASTIC PROCESSES**

Demodulator aids synchronization  
NPO-13605 B76-10164 02  
Birth/death process model  
NPO-13616 B76-10213 05  
Linear stochastic optimal control and  
estimation  
LEWIS-12540 B76-10607 09

**STORAGE STABILITY**

Aseptic fluid-transfer system  
NPO-13743 B76-10210 05

**STORAGE TANKS**

Cryogenic storage tank thermal analysis  
MSC-19103 B76-10234 06  
External heater for cryogenic vessels  
MSC-14056 B76-10337 03

**STRAIN GAGES**

Graphic-to-digital conversion system  
M-FS-24410 B76-10019 02  
Rous system  
LANGLEY-12015 B76-10215 06  
ROUS bolt-tensioning monitor  
LANGLEY-12016 B76-10216 06  
In vivo bone-strain telemetry  
ARC-11074 B76-10535 05

Prefabricated strain-gage connectors  
MSC-19522 B76-10595 08

**STRAPS**

Controlled linear clasper/loader  
GSFC-12105 B76-10432 08

**STREAMS**

Measuring trace dispersants in gas  
streams  
ARC-10896 B76-10374 06

**STRESS (PHYSIOLOGY)**

Accelerator for biomedical studies  
ARC-10898 B76-10367 05

**STRESS ANALYSIS**

Fatigue life of spur and helical gear  
sets  
LEWIS-12596 B76-10224 06  
Faster X-ray analysis of semiconductor  
wafers  
M-FS-23315 B76-10225 06  
Analysis of bonded joints  
LANGLEY-11871 B76-10231 06  
Crack-growth analysis  
M-FS-23320 B76-10243 06  
Astronautic structures manual  
M-FS-23547 B76-10393 06  
Analysis of axisymmetric shell structure  
LANGLEY-12059 B76-10398 06  
SPAR Structural-performance analysis  
and redesign  
LANGLEY-12062 B76-10399 06  
Relative stiffness of flat-conductor  
cable  
M-FS-23537 B76-10469 01

**STRESS CORROSION CRACKING**

Stress-corrosion cracking due to  
hydrazine  
ARC-11093 B76-10526 04

**STRESS CYCLES**

Mechanical loader for testing  
composites  
LEWIS-12432 B76-10548 06

**STRESS FUNCTIONS**

Analysis of bonded joints  
LANGLEY-11871 B76-10231 06

**STRESS MEASUREMENT**

ROUS bolt-tensioning monitor  
LANGLEY-12016 B76-10216 06  
Relative stiffness of flat-conductor  
cable  
M-FS-23537 B76-10469 01

**STRESS-STRAIN DIAGRAMS**

Yield-pressure determination  
MSC-14655 B76-10581 08

**STRESS-STRAIN-TIME RELATIONS**

Reliability of hybrid microcircuit  
bonding  
M-FS-23358 B76-10129 08

**STRESSES**

Transpose of finite-element data  
MSC-19644 B76-10564 06

**STRETCH FORMING**

Forming hard aluminum in complex  
shapes  
MSC-19693 B76-10579 08

**STRETCHERS**

Multiposition rescue litter  
MSC-16148 B76-10368 05

**STRUCTURAL ANALYSIS**

Astronautic structures manual  
M-FS-23547 B76-10393 06  
SPAR Structural-performance analysis  
and redesign  
LANGLEY-12062 B76-10399 06  
General instability analysis  
M-FS-23407 B76-10563 06

- Oblique orthographic projections and contour plots  
 LANGLEY-11877 B76-10601 09
- STRUCTURAL DESIGN CRITERIA**  
 Analysis of axisymmetric shell structure  
 LANGLEY-12059 B76-10398 06  
 Impact of a solid body with water  
 M-FS-23512 B76-10560 06  
 Transpose of finite-element data  
 MSC-19644 B76-10564 06
- STRUCTURAL ENGINEERING**  
 NASTRAN component-mode synthesis  
 MSC-19632 B76-10104 06
- STRUCTURAL FAILURE**  
 Crack-growth analysis  
 M-FS-23320 B76-10243 06  
 Fracture mechanics for weld acceptance  
 M-FS-23360 B76-10282 08
- STRUCTURAL MEMBERS**  
 Modular multipurpose panel support  
 MSC-19641 B76-10421 08
- STRUCTURAL STABILITY**  
 BUCRAP2  
 LANGLEY-11696 B76-10111 06
- STRUCTURAL STRAIN**  
 Stress-corrosion cracking due to hydrazine  
 ARC-11093 B76-10526 04
- STRUCTURAL VIBRATION**  
 Fail-safe hydraulic shaker protection  
 NPO-13726 B76-10218 06  
 Analysis of axisymmetric shell structure  
 LANGLEY-12059 B76-10398 06  
 Active optics simulation system  
 LANGLEY-12104 B76-10512 03
- STUDS (STRUCTURAL MEMBERS)**  
 Slotted bolts and studs for vacuum systems  
 LEWIS-10391 B76-10407 07
- SUBLIMATION**  
 Sublimator/evaporator heat sink  
 ARC-10912 B76-10384 06
- SUBSONIC FLOW**  
 Swept-tapered-wing aerodynamics  
 LANGLEY-11701 B76-10112 06  
 Stability of an elastic airplane  
 ARC-11086 B76-10568 06
- SUBSTRATES**  
 Polymer adhesives for hybrid circuits  
 M-FS-23287 B76-10015 01  
 Low-cost solar reflectors  
 NPO-13707 B76-10123 08  
 Transistor-to-substrate bond quality  
 M-FS-21931 B76-10137 01
- SULFONATES**  
 Solventless intumescent coatings  
 ARC-10996 B76-10194 04
- SULFUR OXIDES**  
 Portable solar radiometer measures stack-plume effluents  
 LANGLEY-12123 B76-10491 03
- SUPERCONDUCTIVITY**  
 Improved microbridge Josephson devices  
 M-FS-23274 B76-10012 01
- SUPERCONDUCTORS**  
 Superconductive neuristor R-junction  
 HQN-10871 B76-10003 01
- SUPERHIGH FREQUENCIES**  
 Waveguide-to-coax transition/low-pass filter  
 NPO-13642 B76-10147 01  
 Low-cost dual-frequency microwave antenna  
 MSC-16100 B76-10462 01
- SUPERSONIC FLOW**  
 Analytic numerical solutions for shock waves  
 ARC-10959 B76-10096 06  
 Shock interference patterns and heating  
 LANGLEY-11497 B76-10240 06  
 Stability of an elastic airplane  
 ARC-11086 B76-10568 06
- SUPERSONIC NOZZLES**  
 REJECT  
 LEWIS-12375 B76-10110 06
- SUPERSONIC TEST APPARATUS**  
 All-nickel hot-wire probe  
 ARC-10911 B76-10379 06
- SUPPORTS**  
 Exercise support for therapy  
 LANGLEY-11975 B76-10074 05  
 Multiposition rescue litter  
 MSC-16148 B76-10368 05  
 Modular multipurpose panel support  
 MSC-19641 B76-10421 08  
 Leveling apparatus for precision instruments  
 ARC-10981 B76-10572 07  
 Improved shelf for electronic modules  
 NPO-13158 B76-10578 07  
 Rigid cable support for blind installations  
 MSC-19473 B76-10585 08
- SURFACE DEFECTS**  
 Fatigue life of spur and helical gear sets  
 LEWIS-12596 B76-10224 06  
 Soldering high-impedance N-chrome wire  
 M-FS-1457 B76-10264 08  
 Monitor for optical-window contamination  
 ARC-10947 B76-10345 03
- SURFACE FINISHING**  
 Improved microbridge Josephson devices  
 M-FS-23274 B76-10012 01  
 Beam splitter/combiner  
 GSFC-12083 B76-10177 03  
 Solventless intumescent coatings  
 ARC-10996 B76-10194 04  
 Abrasion-resistant coatings for plastic surfaces  
 ARC-10915 B76-10201 04  
 Repair of fused silica platens  
 MSC-19713 B76-10276 08  
 Elimination of color rings on film negatives  
 GSFC-12110 B76-10498 03  
 Detection of surface impurities on processed metals  
 MSC-19670 B76-10553 06
- SURFACE LAYERS**  
 Detecting contamination on a metal surface  
 M-FS-19260 B76-10552 06
- SURFACE PROPERTIES**  
 Ellipsometer for measurement in ultrahigh vacuum  
 M-FS-23130 B76-10035 03  
 Measurement of transient reflectance  
 M-FS-23160 B76-10037 03  
 Passive thermal-control coatings  
 M-FS-22794 B76-10071 04  
 Vacuum-ultraviolet reflectometer  
 MSC-14995 B76-10336 03  
 Optical profilometer  
 LANGLEY-11869 B76-10338 03  
 Detecting contamination on a metal surface  
 M-FS-19260 B76-10552 06
- Electric heating for metal surface hardening  
 M-FS-19268 B76-10580 08
- SURFACE TEMPERATURE**  
 Heat-transfer coefficients of pin-finned cylinders  
 LEWIS-12557 B76-10554 06  
 One-wire thermocouple  
 MSC-16220 B76-10556 06
- SURFACE VEHICLES**  
 Vehicle load-equalization system  
 MSC-12466 B76-10249 07
- SURFACE WAVES**  
 Holography with surface plasma waves  
 M-FS-22040 B76-10039 03
- SURFACTANTS**  
 Surfactant-assisted coal liquefaction  
 NPO-13904 B76-10517 04
- SURVIVAL EQUIPMENT**  
 Miniature emergency oxygen unit  
 KSC-11011 B76-10539 05
- SUSPENDING (HANGING)**  
 Vehicle load-equalization system  
 MSC-12466 B76-10249 07
- SUSPENSION SYSTEMS (VEHICLES)**  
 Vehicle load-equalization system  
 MSC-12466 B76-10249 07
- SWAGING**  
 Metalworking method for composites  
 M-FS-23354 B76-10132 08
- SWEPTBACK WINGS**  
 Swept-tapered-wing aerodynamics  
 LANGLEY-11701 B76-10112 06
- SWIMMING**  
 Hand fin for swimming  
 M-FS-21632 B76-10122 07
- SWITCHING CIRCUITS**  
 Power-control switch  
 M-FS-23395 B76-10148 01  
 A nonsaturating dc-to-dc parallel power converter  
 GSFC-12047 B76-10290 01  
 Toroidal converter core  
 NPO-13413 B76-10293 01  
 Majority-voted logic fail-sense circuit  
 NPO-13107 B76-10313 01  
 Solid-state RF switch  
 NPO-13081 B76-10315 01  
 Power supply with optical-isolator control  
 HQN-10827 B76-10466 01
- SYNCHRONISM**  
 Unbalanced quadruphase demodulator  
 MSC-14840 B76-10161 02  
 Tracking a phase-shift-keyed signal  
 MSC-16170 B76-10481 02
- SYSTEM EFFECTIVENESS**  
 Optimal insensitive-controller synthesis  
 M-FS-21666 B76-10103 06
- SYSTEMS ANALYSIS**  
 Input/output error analyzer  
 GSFC-12132 B76-10610 09
- SYSTEMS ENGINEERING**  
 Prevention of design flaws in multicomputer systems  
 MSC-14920 B76-10330 02  
 Design of redundant systems  
 MSC-16026 B76-10383 06

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**TANKS (CONTAINERS)**

Cleaning large tanks and gas bottles  
MSC-14966 B76-10430 09

**TANTALUM**

All-tantalum electrolytic capacitor  
M-FS-23462 B76-10424 08

**TAPE RECORDERS**

Safety brake for tape reels  
GSFC-11960 B76-10412 07  
Recording-tape position sensor  
GSFC-12056 B76-10577 07

**TARGET SIMULATORS**

Video display synthesizer  
MSC-14620 B76-10052 03

**TASK COMPLEXITY**

Learning/cost-improvement curves  
M-FS-23429 B76-10287 09

**TEETH**

Measuring mandibular motions  
ARC-10956 B76-10362 05

**TEFLON (TRADEMARK)**

Fabrication and applications of electrets  
M-FS-23437 B76-10429 08

**TELECOMMUNICATION**

Digital video image system  
M-FS-23322 B76-10166 02  
Advanced imaging communication system  
NPO-13545 B76-10482 02

**TELEMETRY**

Long binary frame sync words  
NPO-13727 B76-10163 02  
Demodulator aids synchronization  
NPO-13605 B76-10164 02  
Microprogramed telemetry processor  
ARC-11061 B76-10460 01  
Flexible high-speed instrumentation system  
FRC-10110 B76-10483 02  
In vivo bone-strain telemetry  
ARC-11074 B76-10535 05

**TELEOPERATORS**

Concentric-tube differential drive  
M-FS-22707 B76-10114 07

**TELESCOPES**

Polishing technique for beryllium mirror  
M-FS-22923 B76-10049 03  
Optical alignment system  
ARC-10932 B76-10178 03  
Optical devices  
HQN-10891 B76-10188 03  
Measuring scatter angle from mirrors  
M-FS-23421 B76-10342 03  
Analysis of laser heterodyne communications  
GSFC-12098 B76-10511 03  
Active optics simulation system  
LANGLEY-12104 B76-10512 03

**TELETYPEWRITER SYSTEMS**

Binary/BCD-to-ASCII data converter  
GSFC-12044 B76-10322 02

**TELEVISION CAMERAS**

Remote, unattended forest fire detector  
M-FS-21221 B76-10077 05  
Color to black-and-white converter  
MSC-12618 B76-10346 03  
Thick-film preamplifier  
NPO-13416 B76-10459 01

**TELEVISION EQUIPMENT**

Vidicon intensifier  
NPO-11912 B76-10054 03  
Analog-to-binary conversion of video data  
GSFC-11918 B76-10165 02

**TELEVISION SYSTEMS**

Selective image enhancement  
M-FS-23364 B76-10021 02

Serial-to-parallel color-TV converter  
MSC-14844 B76-10027 02  
Interactive imaging and data processing  
NPO-13655 B76-10167 02  
Advanced imaging communication system  
NPO-13545 B76-10482 02  
X-ray sensitive oblique imaging device  
GSFC-11935 B76-10504 03

**TELEVISION TRANSMISSION**

Color to black-and-white converter  
MSC-12618 B76-10346 03

**TEMPER (METALLURGY)**

Age-forming aluminum panels  
MSC-12648 B76-10281 08  
Forming hard aluminum in complex shapes  
MSC-19693 B76-10579 08

**TEMPERATURE CONTROL**

Thermal insulation for high-temperature systems  
GSFC-10954 B76-10064 04  
Passive thermal-control coatings  
M-FS-22794 B76-10071 04  
Self-contained constant-temperature heat absorber  
M-FS-22989 B76-10091 06  
Measurement of rapidly-changing heating rates  
LANGLEY-11380 B76-10097 06  
Efficient low static-volume water heater  
M-FS-22469 B76-10116 07  
Thermal/acoustical insulation foam  
MSC-14795 B76-10195 04  
Improved insulation material  
MSC-14642 B76-10197 04  
Heat pipe technology  
HQN-10901 B76-10233 06  
Solar heating and cooling performance  
M-FS-23432 B76-10235 06  
NECAP NASA Energy-cost analysis program  
LANGLEY-11888 B76-10239 06  
Multilayer insulative systems  
LANGLEY-12057 B76-10528 04  
Liquid-cooled bra for cancer detection  
ARC-11007 B76-10533 05  
NASA technology utilization house  
LANGLEY-12134 B76-10570 07  
Economical solar-heating for homes  
LANGLEY-12135 B76-10571 07

**TEMPERATURE DISTRIBUTION**

Multidimensional heat conduction  
MSC-16159 B76-10509 03  
Multilayer insulative systems  
LANGLEY-12057 B76-10528 04

**TEMPERATURE EFFECTS**

Cyclical bidirectional rotary actuator  
GSFC-11883 B76-10117 07  
Thermoluminescence for forensic analysis  
NPO-11607 B76-10192 04

**TEMPERATURE MEASUREMENT**

Self-contained constant-temperature heat absorber  
M-FS-22989 B76-10091 06  
Joule-Thomson data curves  
KSC-10538 B76-10102 06  
Automatic fire/weather data station  
ARC-10993 B76-10160 02  
One-wire thermocouple  
MSC-16220 B76-10556 06

**TEMPERATURE MEASURING INSTRUMENTS**

Zero-angle helical coil  
GSFC-10969 B76-10085 06

Measurement of rapidly-changing heating rates  
LANGLEY-11380 B76-10097 06  
Self-calibrating radiometer  
ARC-10811 B76-10339 03  
Temperature reference for microwave radiometer calibration  
LANGLEY-11355 B76-10503 03

**TEMPERATURE SENSORS**

Remote, unattended, forest fire detector  
M-FS-21221 B76-10077 05  
Self-contained constant-temperature heat absorber  
M-FS-22989 B76-10091 06  
Measurement of rapidly-changing heating rates  
LANGLEY-11380 B76-10097 06

**TEMPERING**

Electric heating for metal surface hardening  
M-FS-19268 B76-10580 08

**TEMPLATES**

Electrical-conduit sizing gage  
MSC-19491 B76-10150 01  
Age-forming aluminum panels  
MSC-12648 B76-10281 08

**TENSILE PROPERTIES**

Dynamic load attenuator  
MSC-17472 B76-10416 07

**TENSILE STRENGTH**

Large-diameter fasteners of CRES alloy  
MSC-19313 B76-10250 07  
Annealing strained alloy 718  
M-FS-19242 B76-10284 08

**TENSOMETERS**

Laser extensometer  
M-FS-19259 B76-10030 03

**TERMINAL GUIDANCE**

Video display synthesizer  
MSC-14620 B76-10052 03

**TERRAIN**

DAM - detection and mapping  
MSC-16096 B76-10370 05

**TERRAIN ANALYSIS**

Remote sensing of vegetation and soil  
GSFC-11976 B76-10490 03

**TEST EQUIPMENT**

Remote access of modem by digital control  
GSFC-11943 B76-10022 02  
Direct-reading inductance meter  
NPO-13792 B76-10473 02

**TEST FACILITIES**

Solar heated and cooled office building  
LEWIS-12512 B76-10395 06  
Electrostatic-discharge damage to semiconductors  
LANGLEY-11739 B76-10586 08

**TEST STANDS**

Overhead tray for cable test system  
MSC-19488 B76-10270 08

**THEODOLITES**

Optical alignment system  
ARC-10932 B76-10178 03

**THERAPY**

Exercise support for therapy  
LANGLEY-11975 B76-10074 05  
Manual dexterity evaluator  
LANGLEY-12022 B76-10209 05  
Short-range biotelemetry system  
MSC-16011 B76-10369 05

**THERMAL ABSORPTION**

Self-contained constant-temperature heat absorber  
M-FS-22989 B76-10091 06  
Solar concentrator/absorber  
M-FS-23428 B76-10253 07

- Sublimator/evaporator heat sink  
ARC-10912 B76-10384 06
- THERMAL CONDUCTIVITY**  
Faceted solar energy collectors  
MSC-12687 B76-10182 03  
Heat pipe technology  
HQN-10901 B76-10233 06
- THERMAL CONDUCTORS**  
Thermal-diode heat pipe  
ARC-10997 B76-10223 06
- THERMAL CONTROL COATINGS**  
Transparent and flame-retardant potting compounds  
MSC-14669 B76-10066 04  
Passive thermal-control coatings  
M-FS-22794 B76-10071 04  
Parylene coating for circuit components  
M-FS-23450 B76-10583 08
- THERMAL CYCLING TESTS**  
Battery-cell thermal test facility  
M-FS-23040 B76-10124 08
- THERMAL ENERGY**  
Faceted solar energy collectors  
MSC-12687 B76-10182 03  
Solar thermal energy utilization A bibliography with abstracts  
HQN-10900 B76-10186 03  
Proposed low-temperature solar engine  
M-FS-23403 B76-10254 07  
NASA technology utilization house  
LANGLEY-12134 B76-10570 07  
Economical solar-heating for homes  
LANGLEY-12135 B76-10571 07
- THERMAL EXPANSION**  
Laser extensometer  
M-FS-19259 B76-10030 03  
Vacuum-jacketed line spacer  
MSC-14365 B76-10083 06  
Zero-angle helical coil  
GSFC-10969 B76-10085 06  
Proposed low-temperature solar engine  
M-FS-23403 B76-10254 07  
Precision measurement of changes in physical dimensions  
M-FS-23527 B76-10543 06
- THERMAL FATIGUE**  
Comparative thermal fatigue resistance  
LEWIS-12563 B76-10062 04
- THERMAL INSULATION**  
Thermal insulation for high-temperature systems  
GSFC-10954 B76-10064 04  
Coatings for mullite insulation  
LANGLEY-11150 B76-10067 04  
Cryogenic storage tank thermal analysis  
MSC-19103 B76-10234 06  
External heater for cryogenic vessels  
MSC-14056 B76-10337 03  
Flexible-pile thermal sealant  
MSC-19568 B76-10371 06  
Fuel-cell powerplant insulation  
MSC-16012 B76-10426 08  
Multilayer insulative systems  
LANGLEY-12057 B76-10528 04
- THERMAL PROTECTION**  
Thermal insulation for high-temperature systems  
GSFC-10954 B76-10064 04  
Improved insulation material  
MSC-14642 B76-10197 04  
Multidimensional heat conduction  
MSC-16159 B76-10509 03
- THERMAL RADIATION**  
Measurement of rapidly-changing heating rates  
LANGLEY-11380 B76-10097 06
- Self-calibrating radiometer  
ARC-10811 B76-10339 03  
Improved solar-energy collector  
NPO-13813 B76-10486 03  
Multidimensional heat conduction  
MSC-16159 B76-10509 03  
Thermal-radiation model  
M-FS-23538 B76-10562 06
- THERMAL STABILITY**  
High-temperature flat-conductor cable  
M-FS-23451 B76-10144 01
- THERMAL STRESSES**  
Comparative thermal fatigue resistance  
LEWIS-12563 B76-10062 04  
Improved high-temperature heater with stabilized-zirconia elements  
M-FS-23351 B76-10221 06  
Astronautic structures manual  
M-FS-23547 B76-10393 06
- THERMAL VACUUM TESTS**  
Thermal/vacuum testing of laser corner-cube retroreflectors  
M-FS-23565 B76-10549 06
- THERMIONIC CONVERTERS**  
Hybrid-mode thermionic converter  
HQN-10876 B76-10056 03
- THERMOCOUPLES**  
Measurement of rapidly-changing heating rates  
LANGLEY-11380 B76-10097 06  
One-wire thermocouple  
MSC-16220 B76-10556 06  
Aluminum transfer method for plating plastics  
MSC-16221 B76-10593 08
- THERMODYNAMIC PROPERTIES**  
Battery-cell thermal test facility  
M-FS-23040 B76-10124 08  
Transient thermal analysis of fluid systems  
MSC-19502 B76-10401 06  
Multidimensional heat conduction  
MSC-16159 B76-10509 03  
Electrolyte cells measure oxygen fugacities  
MSC-16089 B76-10523 04  
Multilayer insulative systems  
LANGLEY-12057 B76-10528 04  
Integral-matrix procedure for boundary-layer problems  
M-FS-23348 B76-10608 09  
Systems improved numerical differencing analyzer  
MSC-13805 B76-10609 09
- THERMODYNAMICS**  
Thermal network modeling handbook  
MSC-14964 B76-10236 06
- THERMOELECTRIC MATERIALS**  
Pyroionic infrared detector  
LANGLEY-11921 B76-10204 04
- THERMOELECTRICITY**  
Elimination of thermally generated EMF's on PC boards  
MSC-16125 B76-10594 08
- THERMOGRAVIMETRY**  
Experimental data for new fire-retardant materials  
MSC-16022 B76-10361 04
- THERMOHYDRAULICS**  
Transient thermal analysis of fluid systems  
MSC-19502 B76-10401 06
- THERMOLUMINESCENCE**  
Thermoluminescence for forensic analysis  
NPO-11607 B76-10192 04
- Low-temperature thermoluminescence  
NPO-11935 B76-10193 04
- THERMOPHYSICAL PROPERTIES**  
Self-calibrating radiometer  
ARC-10811 B76-10339 03
- THERMOPLASTICITY**  
Voltage control for corona charging thermoplastics  
M-FS-23102 B76-10043 03
- THERMOSETTING RESINS**  
Low-pressure low-temperature molding process  
MSC-19778 B76-10425 08  
New diamine hardeners for epoxies  
LANGLEY-11823 B76-10522 04
- THERMOVISCOELASTICITY**  
Viscoelastic foam cushion  
ARC-11089 B76-10525 04
- THICKNESS**  
Myocardial wall-thickness transducer  
NPO-13644 B76-10075 05
- THIN FILMS**  
Ellipsometer for measurement in ultrahigh vacuum  
M-FS-23130 B76-10035 03  
Measurement of transient reflectance  
M-FS-23160 B76-10037 03  
Solar selective surfaces  
LEWIS-12614 B76-10047 03  
Faster X-ray analysis of semiconductor wafers  
M-FS-23315 B76-10225 06  
Hybrid thin-film amplifier  
MSC-13975 B76-10314 01  
Molecular beam generator  
MSC-14996 B76-10353 04  
Aluminum transfer method for plating plastics  
MSC-16221 B76-10593 08
- THREE DIMENSIONAL MOTION**  
Tracking system for moving subjects  
HQN-10880 B76-10028 02  
Concentric-tube differential drive  
M-FS-22707 B76-10114 07
- THRESHOLD LOGIC**  
Superconductive neuristor R-junction  
HQN-10871 B76-10003 01  
Pulse amplitude discriminator threshold calibration  
GSFC-11912 B76-10023 02  
Signal level detector  
NPO-13272 B76-10310 01
- THRUST**  
Propellant side feed  
LANGLEY-11082 B76-10094 06
- THRUST MEASUREMENT**  
Propellant side feed  
LANGLEY-11082 B76-10094 06
- TIBIA**  
In vivo bone-strain telemetry  
ARC-11074 B76-10535 05
- TIGHTNESS**  
High-torque open-end wrench  
NPO-13541 B76-10405 07
- TILES**  
Hot-wire tile removal tool  
KSC-11043 B76-10433 08
- TIME DIVISION MULTIPLEXING**  
Data system for multiplexed water-current meters  
M-FS-23343 B76-10493 03
- TIMING DEVICES**  
Signal processing and display for electrochemical data  
LANGLEY-11922 B76-10327 02

- TIPS**  
Improved soldering iron tip  
M-FS-19349 B76-10145 01
- TITANIUM ALLOYS**  
Machining titanium alloys  
M-FS-23006 B76-10283 08
- TOOLS**  
Roll-forming tubes to header plates  
LEWIS-10513 B76-10130 08  
Improved soldering iron tip  
M-FS-19349 B76-10145 01  
Tool removes brazed fittings  
LANGLEY-10944 B76-10244 07  
Rotary broaches  
M-FS-23374 B76-10248 07  
Method of removing drilling chips  
M-FS-19235 B76-10262 08  
Machining titanium alloys  
M-FS-23006 B76-10283 08  
High-torque open-end wrench  
NPO-13541 B76-10405 07  
Precision centering vise  
KSC-11041 B76-10409 07  
Hot-wire tile removal tool  
KSC-11043 B76-10433 08  
Flange weld pressure testing  
M-FS-19292 B76-10546 06  
Leveling apparatus for precision instruments  
ARC-10981 B76-10572 07
- TOPOGRAPHY**  
DAM - detection and mapping  
MSC-16096 B76-10370 05  
Remote sensing of vegetation and soil  
GSFC-11976 B76-10490 03  
Geodetic control net  
NPO-13718 B76-10510 03
- TOROIDS**  
Pulse transformer for GaAs laser  
M-FS-23399 B76-10185 03  
Toroidal converter core  
NPO-13413 B76-10293 01
- TORQUE MOTORS**  
Ironless-armature brushless motor  
GSFC-11880 B76-10476 02
- TORQUERS**  
Ironless-armature brushless motor  
GSFC-11880 B76-10476 02
- TOUGHNESS**  
Ultrasonic measurement of fracture toughness  
LEWIS-12642 B76-10372 06
- TOURNIQUETS**  
Interlocking butterfly tourniquet  
MSC-19382 B76-10532 05
- TRACE CONTAMINANTS**  
Measuring trace dispersants in gas streams  
ARC-10896 B76-10374 06
- TRACKING (POSITION)**  
Horizontally-mounted solar collector  
M-FS-23349 B76-10256 07  
Synchronized backside-weld follower  
M-FS-24454 B76-10272 08  
Independent trajectory determination system  
GSFC-11923 B76-10569 06
- TRACKING FILTERS**  
Charge-sensitive amplifier with notched frequency response  
LANGLEY-11317 B76-10440 01
- TRACKING NETWORKS**  
Tracking system for moving subjects  
HQN-10880 B76-10028 02
- TRAINING SIMULATORS**  
Multiplane binocular visual display system  
ARC-10808 B76-10168 02  
Video simulator with electronic ranging  
MSC-14965 B76-10474 02  
Full-color hybrid display  
ARC-10903 B76-10477 02
- TRAJECTORY ANALYSIS**  
GEODYN Orbital and geodetic parameter estimation  
GSFC-12014 B76-10396 06  
Independent trajectory determination system  
GSFC-11923 B76-10569 06
- TRANSDUCERS**  
Electro-optical liquid depth sensor  
M-FS-22921 B76-10024 02  
Hybrid-mode thermionic converter  
HQN-10876 B76-10056 03  
Myocardial wall-thickness transducer  
NPO-13644 B76-10075 05  
Measuring mandibular motions  
ARC-10956 B76-10362 05  
Disposable biomedical electrode  
MSC-14623 B76-10363 05  
Improved gas-pressure transducer  
ARC-10639 B76-10381 06  
In vivo bone-strain telemetry  
ARC-11074 B76-10535 05  
Miniature-angular-position transducer  
LANGLEY-11999 B76-10555 06  
Transducer bonding kit  
MSC-19690 B76-10587 08
- TRANSFER FUNCTIONS**  
Transfer-function parameters  
LEWIS-12612 B76-10605 09
- TRANSFORMATIONS (MATHEMATICS)**  
Transfer-function parameters  
LEWIS-12612 B76-10605 09
- TRANSFORMERS**  
Toroidal converter core  
NPO-13413 B76-10293 01  
Feedback arrangement for regenerative switches  
NPO-13060 B76-10302 01  
Diplexer switch  
LANGLEY-11546 B76-10448 01  
Transformer design tradeoffs  
NPO-13755 B76-10470 01
- TRANSIENT LOADS**  
DYNGEN  
LEWIS-12506 B76-10108 06
- TRANSIENT OSCILLATIONS**  
A nonsaturating dc-to-dc parallel power converter  
GSFC-12047 B76-10290 01
- TRANSIENT RESPONSE**  
Peak-acceleration limiter  
NPO-11940 B76-10082 06
- TRANSISTOR CIRCUITS**  
Power-control switch  
M-FS-23395 B76-10148 01
- TRANSISTORS**  
Transistor-to-substrate bond quality  
M-FS-21931 B76-10137 01
- TRANSITION METALS**  
Catalysts for low-energy aldehyde processes  
NPO-13827 B76-10519 04
- TRANSMISSION**  
Dielectric covered antennas  
MSC-16186 B76-10471 01
- TRANSMISSION LINES**  
Waveguide-to-coax transition/low-pass filter  
NPO-13642 B76-10147 01
- Testing flat-conductor cable  
M-FS-23174 B76-10151 01  
Surface mounted flat-conductor cable  
M-FS-223135 B76-10152 01  
Temperature rise of installed FCC  
M-FS-23127 B76-10153 01  
Pulse transformer for GaAs laser  
M-FS-23399 B76-10185 03  
Wideband distribution amplifier  
NPO-13256 B76-10307 01  
Time-domain reflectometry for cable-fault isolation  
KSC-10741 B76-10377 06  
Effects of mismatch on group delay of microwave transmission  
NPO-13863 B76-10478 02
- TRANSDUCERS**  
Low-cost pressure-data encoder  
NPO-13692 B76-10303 01
- TRANSVERSE WAVES**  
Multifrequency, broadband, dual-polarized antenna  
NPO-13866 B76-10464 01
- TRAYS**  
Overhead tray for cable test system  
MSC-19488 B76-10270 08
- TRIANGULATION**  
Contouring randomly spaced data  
LANGLEY-12044 B76-10436 09
- TRIGGER CIRCUITS**  
Power supply with optical-isolator control  
HQN-10827 B76-10466 01
- TRUNCATION ERRORS**  
Guide for testing numerical-integration subroutines  
NPO-11644 B76-10135 09
- TUNGSTEN**  
Containerless processing of tungsten  
M-FS-23509 B76-10422 08
- TUNING**  
Band-elimination filter  
M-FS-23303 B76-10295 01
- TURBINE ENGINES**  
REJECT  
LEWIS-12375 B76-10110 06  
Improved automobile gas turbine engine  
LEWIS-12521 B76-10115 07  
Design analysis of radial-inflow turbines  
LEWIS-12684 B76-10561 06
- TURBINE INSTRUMENTS**  
Improved automobile gas turbine engine  
LEWIS-12521 B76-10115 07  
Automated secondary standard for liquid flowmeters  
LEWIS-12695 B76-10544 06
- TURBINE PUMPS**  
Hydrostatic lift-off seal  
M-FS-21496 B76-10079 06
- TURBINES**  
Predicting off-design performance of radial-inflow turbines  
LEWIS-12500 B76-10242 06
- TURBOFAN ENGINES**  
DYNGEN  
LEWIS-12506 B76-10108 06
- TURBOJET ENGINES**  
DYNGEN  
LEWIS-12506 B76-10108 06
- TURBOMACHINERY**  
Improved automobile gas turbine engine  
LEWIS-12521 B76-10115 07



**TURBULENCE**

- Gust alleviation for STOL aircraft  
 LANGLEY-11413 B76-10099 06  
 Outer flow and turbulence in boundary layers  
 M-FS-23286 B76-10100 06

**TURBULENT BOUNDARY LAYER**

- Outer flow and turbulence in boundary layers  
 M-FS-23286 B76-10100 06  
 Shock interference patterns and heating  
 LANGLEY-11497 B76-10240 06  
 Integral-matrix procedure for boundary-layer problems  
 M-FS-23348 B76-10608 09

**TURBULENT FLOW**

- Hot-wire probe  
 ARC-10900 B76-10222 06  
 Estimating aircraft states  
 ARC-10969 B76-10567 06

**TURBULENT WAKES**

- Airport laser-Doppler  
 M-FS-23423 B76-10174 03  
 Trimmed noncoplanar planforms with minimum vortex drag  
 LANGLEY-12121 B76-10566 06

**U****ULTRASONIC MACHINING**

- Acoustic-energy shaping of malleable metals  
 NPO-13802 B76-10423 08

**ULTRASONIC TESTS**

- Rous system  
 LANGLEY-12015 B76-10215 06  
 Computer-automated ultrasonic inspection system  
 M-FS-23338 B76-10217 06  
 Ultrasonic measurement of fracture toughness  
 LEWIS-12642 B76-10372 06  
 Ultrasonic monitoring of crack extension  
 LEWIS-12632 B76-10547 06

**ULTRASONIC WAVE TRANSDUCERS**

- Ultraviolet fire detector  
 M-FS-21577 B76-10016 02  
 Biomedical ultrasonoscope  
 ARC-10994 B76-10537 05

**ULTRASONIC WELDING**

- Solar cell electrical connections  
 LEWIS-12293 B76-10260 08

**ULTRASONICS**

- Rous system  
 LANGLEY-12015 B76-10215 06  
 ROUS bolt-tensioning monitor  
 LANGLEY-12016 B76-10216 06  
 Computer-automated ultrasonic inspection system  
 M-FS-23338 B76-10217 06  
 Biomedical ultrasonoscope  
 ARC-10994 B76-10537 05

**ULTRAVIOLET FILTERS**

- Pinhole diffraction filter  
 GSFC-12120 B76-10333 03

**ULTRAVIOLET RADIATION**

- Ultraviolet fire detector  
 M-FS-21577 B76-10016 02  
 Microchannel detector array for X-rays and UV  
 M-FS-23324 B76-10053 03

**ULTRAVIOLET REFLECTION**

- Vacuum-ultraviolet reflectometer  
 MSC-14995 B76-10336 03

- Measuring scatter angle from mirrors  
 M-FS-23421 B76-10342 03

**ULTRAVIOLET SPECTROMETERS**

- Portable solar radiometer measures stack-plume effluents  
 LANGLEY-12123 B76-10491 03

**UNDERCARRIAGES**

- Vehicle load-equalization system  
 MSC-12466 B76-10249 07

**UNDERWATER ENGINEERING**

- Hand fin for swimming  
 M-FS-21632 B76-10122 07

**UNIONS (CONNECTORS)**

- Flexible fitting for fluid lines  
 MSC-17780 B76-10277 08  
 Soft seat A-N fitting for vacuum use  
 LEWIS-10130 B76-10408 07

**UREAS**

- Extraction of urea and ammonium ion  
 ARC-11064 B76-10515 04  
 Membrane has high urea-rejection properties  
 ARC-10980 B76-10518 04

**URINALYSIS**

- Signal processing and display for electrochemical data  
 LANGLEY-11922 B76-10327 02  
 Inexpensive portable drug detector  
 ARC-10633 B76-10534 05  
 Fast measurement of bacterial susceptibility to antibiotics  
 GSFC-10246 B76-10536 05

**UROLOGY**

- Fast measurement of bacterial susceptibility to antibiotics  
 GSFC-10246 B76-10536 05

**V****V/STOL AIRCRAFT**

- Estimating aircraft states  
 ARC-10969 B76-10567 06

**VACUUM APPARATUS**

- Ultra-high-vacuum electrical feedthrough  
 HQN-10799 B76-10005 01  
 Ellipsometer for measurement in ultrahigh vacuum  
 M-FS-23130 B76-10035 03  
 Soft seat A-N fitting for vacuum use  
 LEWIS-10130 B76-10408 07  
 Vacuum holddown fixture  
 MSC-19666 B76-10589 08

**VACUUM CHAMBERS**

- Inexpensive leak-detector envelope  
 LEWIS-11305 B76-10084 06  
 Slotted bolts and studs for vacuum systems  
 LEWIS-10391 B76-10407 07  
 Multispecies transient simulator  
 MSC-14862 B76-10527 04

**VACUUM DEPOSITION**

- Molecular beam generator  
 MSC-14996 B76-10353 04

**VACUUM MELTING**

- Containerless processing of tungsten  
 M-FS-23509 B76-10422 08

**VACUUM PUMPS**

- Field sampling fine-vacuum system  
 KSC-10596 B76-10118 07

**VACUUM SYSTEMS**

- Slotted bolts and studs for vacuum systems  
 LEWIS-10391 B76-10407 07

**VALVES**

- Constant-rate fluid-delivery system  
 MSC-14905 B76-10214 06  
 Gas boost compressor  
 MSC-14757 B76-10415 07  
 Long-life ball-valve design  
 M-FS-19282 B76-10576 07

**VAPOR DEPOSITION**

- Triple-layer bubble-domain film  
 LANGLEY-11755 B76-10006 01  
 Molecular beam generator  
 MSC-14996 B76-10353 04  
 Containerless processing of tungsten  
 M-FS-23509 B76-10422 08

**VAPORIZING**

- Liquid-retention canopy  
 M-FS-24133 B76-10092 06

**VAPORS**

- Vapor corrosion inhibitors  
 M-FS-19232 B76-10206 04

**VARACTOR DIODE CIRCUITS**

- Fabrication of ultra-low-noise amplifier  
 GSFC-12186 B76-10596 08

**VARIANCE**

- Multivariate normal integration  
 M-FS-22867 B76-10288 09

**VEGETATION**

- Remote sensing of vegetation and soil  
 GSFC-11976 B76-10490 03

**VEHICLE WHEELS**

- Powered wheel for aircraft  
 LANGLEY-12053 B76-10411 07  
 Omnidirectional wheel  
 M-FS-21309 B76-10575 07

**VELOCITY DISTRIBUTION**

- Laser-Doppler measurement of air turbulence  
 M-FS-23155 B76-10031 03  
 Standard aerosols for particle velocimeters  
 M-FS-23075 B76-10050 03

**VELOCITY MEASUREMENT**

- Automated secondary standard for liquid flowmeters  
 LEWIS-12695 B76-10544 06

**VENTILATION**

- Improved shelf for electronic modules  
 NPO-13158 B76-10578 07

**VENTING**

- Venting for condensation in gas lines  
 MSC-19621 B76-10109 06

**VENTURI TUBES**

- Cavitating performance of pumping machinery  
 LEWIS-12423 B76-10394 06

**VENUS ATMOSPHERE**

- Borosilicate glass-to-Kovar tube bonding  
 GSFC-12077 B76-10278 08

**VERTICAL LANDING**

- Air-cushion landing systems  
 LANGLEY-11783 B76-10397 06

**VIBRATION**

- Analysis of axisymmetric shell structure  
 LANGLEY-12059 B76-10398 06

**VIBRATION MEASUREMENT**

- NASTRAN component-mode synthesis  
 MSC-19632 B76-10104 06  
 Pump failure monitor  
 M-FS-23366 B76-10219 06

**VIBRATION TESTS**

- Fail-safe hydraulic shaker protection  
 NPO-13726 B76-10218 06

**VIBRATIONAL SPECTRA**

- Pump failure monitor  
 M-FS-23366 B76-10219 06

SPAR Structural-performance analysis and redesign  
 LANGLEY-12062 876-10399 06

**VIBRATIONAL STRESS**  
 Fail-safe hydraulic shaker protection  
 NPO-13726 876-10218 06

**VIDEO COMMUNICATION**  
 Digital video image system  
 M-FS-23322 876-10166 02

**VIDEO DATA**  
 Selective image enhancement  
 M-FS-23364 876-10021 02  
 Serial-to-parallel color-TV converter  
 MSC-14844 876-10027 02  
 Analog-to-binary conversion of video data  
 GSFC-11918 876-10165 02  
 Digital video image system  
 M-FS-23322 876-10166 02  
 Interactive imaging and data processing  
 NPO-13655 876-10167 02  
 Low-light-level integrating video system  
 M-FS-23288 876-10347 03  
 Video simulator with electronic ranging  
 MSC-14965 876-10474 02  
 Advanced imaging communication system  
 NPO-13545 876-10482 02

**VIDEO EQUIPMENT**  
 Unichromatic-carrier color-TV system  
 MSC-14683 876-10026 02  
 Video display synthesizer  
 MSC-14620 876-10052 03  
 Low-light-level integrating video system  
 M-FS-23288 876-10347 03  
 Magnifying image intensifier  
 GSFC-12010 876-10506 03

**VIDICONS**  
 Vidicon intensifier  
 NPO-11912 876-10054 03

**VISCOELASTICITY**  
 Viscoelastic foam cushion  
 ARC-11089 876-10525 04

**VISCOUS DAMPING**  
 Fluid-film bearing damper  
 LEWIS-11158 876-10378 06

**VISCOUS FLOW**  
 Swept wing aerodynamics  
 ARC-10790 876-10403 06

**VISCOUS FLUIDS**  
 COMOC a finite-element algorithm for the Navier-Stokes equations  
 LANGLEY-11480 876-10241 06  
 Nucleation of electronic-crystal regions  
 876-10524 04

**VISUAL AIDS**  
 Multiplane binocular visual display system  
 ARC-10808 876-10168 02

**VISUAL PERCEPTION**  
 Visual projection reticle  
 ARC-10976 876-10590 08

**VITREOUS MATERIALS**  
 Low-cost solar reflectors  
 NPO-13707 876-10123 08  
 Enamel for high-temperature superalloys  
 M-FS-22804 876-10358 04

**VOCODERS**  
 Oral annunciator with programmable vocabulary  
 MSC-14798 876-10326 02

**VOICE COMMUNICATION**  
 Oral annunciator with programmable vocabulary  
 MSC-14798 876-10326 02

**VOICE DATA PROCESSING**  
 Oral annunciator with programmable vocabulary  
 MSC-14798 876-10326 02

**VOID RATIO**  
 Composite laminate warpage  
 LEWIS-12615 876-10355 04

**VOLT-AMPERE CHARACTERISTICS**  
 Determination of radiative current in LED's  
 GSFC-12034 876-10042 03

**VOLTAGE AMPLIFIERS**  
 DC-to-DC conversion with voltage multipliers  
 LEWIS-12297 876-10138 01

**VOLTAGE CONVERTERS (DC TO DC)**  
 DC-to-DC conversion with voltage multipliers  
 LEWIS-12297 876-10138 01  
 Compact reconditioner for Ni/Cd cells  
 M-FS-23270 876-10141 01  
 Free-space microwave-power transmission  
 M-FS-23443 876-10162 02  
 Inductorless voltage multiplier/converter  
 NPO-13757 876-10445 01  
 Low-power programmable high-voltage supply  
 LANGLEY-11316 876-10458 01  
 Active inrush-current limiter  
 GSFC-11789 876-10467 01

**VOLTAGE GENERATORS**  
 JPL solar power experiments  
 NPO-13461 876-10098 06

**VOLTAGE REGULATORS**  
 Voltage control for corona charging thermoplastics  
 M-FS-23102 876-10043 03  
 Battery single-cell protection system  
 LEWIS-12039 876-10306 01  
 Voltage-offset reduction in data transmitters  
 MSC-14933 876-10321 02  
 Low-power programmable high-voltage supply  
 LANGLEY-11316 876-10458 01  
 Power supply with optical-isolator control  
 HQN-10827 876-10466 01

**VOLTMETERS**  
 Battery single-cell protection system  
 LEWIS-12039 876-10306 01

**VON KARMAN EQUATION**  
 Impact of a solid body with water  
 M-FS-23512 876-10560 06

**VORTICES**  
 Standard aerosols for particle velocimeters  
 M-FS-23075 876-10050 03  
 Wingtip smoke generator  
 ARC-10905 876-10373 06  
 Estimating subsonic aerodynamic characteristics of complex planforms  
 LANGLEY-11047 876-10565 06  
 Trimmed noncoplanar planforms with minimum vortex drag  
 LANGLEY-12121 876-10566 06

W

**WALKING MACHINES**  
 An artificial leg for hip disarticulation  
 ARC-10916 876-10541 05

**WALL PRESSURE**  
 Yield-pressure determination  
 MSC-14655 876-10581 08

**WARNING SYSTEMS**  
 Overload-protector/fault-indicator circuit  
 NPO-13592 876-10308 01  
 Plug-in circuit monitor  
 MSC-19455 876-10311 01  
 Majority-voted logic fail-sense circuit  
 NPO-13107 876-10313 01  
 Inexpensive low-voltage solid-state alarm  
 LEWIS-12544 876-10320 02  
 Remote moisture-content balance  
 ARC-11032 876-10492 03  
 Caution and warning system  
 MSC-16046 876-10531 05  
 NASA technology utilization house  
 LANGLEY-12134 876-10570 07

**WARPAGE**  
 Composite laminate warpage  
 LEWIS-12615 876-10355 04

**WASHERS (SPACERS)**  
 Dynamic load attenuator  
 MSC-17472 876-10416 07

**WASTE DISPOSAL**  
 ESOP Version IV Energy systems optimization program  
 MSC-14854 876-10106 06  
 Manual trash compactor  
 MSC-16039 876-10390 06

**WASTE ENERGY UTILIZATION**  
 NECAP NASA Energy-cost analysis program  
 LANGLEY-11888 876-10239 06  
 Manual trash compactor  
 MSC-16039 876-10390 06  
 Energy conversion system  
 NPO-13510 876-10485 03

**WASTES**  
 Stopping small liquid leaks  
 KSC-10667 876-10126 08  
 Manual trash compactor  
 MSC-16039 876-10390 06  
 Hydrofoil controls outfall effluents in rivers and oceans  
 LANGLEY-12045 876-10488 03

**WATER CURRENTS**  
 Data system for multiplexed water-current meters  
 M-FS-23343 876-10493 03

**WATER FLOW**  
 Data system for multiplexed water-current meters  
 M-FS-23343 876-10493 03

**WATER POLLUTION**  
 Low-temperature thermoluminescence  
 NPO-11935 876-10193 04  
 Signal processing and display for electrochemical data  
 LANGLEY-11922 876-10327 02  
 Economical measurement of particle concentration  
 GSFC-12088 876-10332 03  
 Remote water-monitoring system  
 LANGLEY-11973 876-10365 05  
 Contamination monitoring of fluids  
 KSC-11037 876-10382 06

**WATER RECLAMATION**  
 NASA technology utilization house  
 LANGLEY-12134 876-10570 07

**WATER RESOURCES**  
 Remote sensing of natural resources  
 HQN-10899 876-10238 06  
 Remote sensing of vegetation and soil  
 GSFC-11976 876-10490 03

**WATER TEMPERATURE**

Efficient low static-volume water heater  
M-FS-22469 B76-10116 07

**WATER TREATMENT**

Extracting lignins from mill wastes  
NPO-13847 B76-10514 04  
Extraction of urea and ammonium ion  
ARC-11064 B76-10515 04  
Less-costly activated carbon for sewage treatment  
NPO-13877 B76-10516 04

**WATER VAPOR**

Quartz-crystal-oscillator hygrometer  
GSFC-12153 B76-10349 03

**WATERPROOFING**

Coatings for mullite insulation  
LANGLEY-11150 B76-10067 04

**WAVE DIFFRACTION**

Pinhole diffraction filter  
GSFC-12120 B76-10333 03

**WAVE FRONT RECONSTRUCTION**

Holography with surface plasma waves  
M-FS-22040 B76-10039 03

**WAVE FRONTS**

Simplified explosive-weld evaluation  
MSC-14654 B76-10228 06  
Effects of mismatch on group delay of microwave transmission  
NPO-13863 B76-10478 02

**WAVE PROPAGATION**

Impedance of curved ducts  
LEWIS-12636 B76-10237 06  
Dielectric covered antennas  
MSC-16186 B76-10471 01  
Effects of mismatch on group delay of microwave transmission  
NPO-13863 B76-10478 02

**WAVEFORMS**

Automated EEG acquisition  
MSC-16111 B76-10364 05

**WAVEGUIDE ANTENNAS**

Multifrequency broadband  
dual-polarized antenna  
NPO-13866 B76-10464 01

**WAVEGUIDE FILTERS**

Waveguide-to-coax transition/low-pass filter  
NPO-13642 B76-10147 01

**WAVEGUIDE TUNERS**

Fabrication of ultra-low-noise amplifier  
GSFC-12186 B76-10596 08

**WAVEGUIDES**

Waveguide-to-coax transition/low-pass filter  
NPO-13642 B76-10147 01  
Pulse transformer for GaAs laser  
M-FS-23399 B76-10185 03  
Effects of mismatch on group delay of microwave transmission  
NPO-13863 B76-10478 02

**WEATHER**

All-weather ice information system  
LEWIS-12638 B76-10018 02

**WEATHER DATA RECORDERS**

All-weather ice information system  
LEWIS-12638 B76-10018 02  
Automatic fire/weather data station  
ARC-10993 B76-10160 02

**WEATHER FORECASTING**

All-weather ice information system  
LEWIS-12638 B76-10018 02  
Automatic fire/weather data station  
ARC-10993 B76-10160 02  
Relative humidity from psychrometric data  
FRC-10108 B76-10285 09

**WELD TESTS**

Computer-automated ultrasonic inspection system  
M-FS-23338 B76-10217 06  
Fracture mechanics for weld acceptance  
M-FS-23360 B76-10282 08

**WELDED JOINTS**

Flange weld pressure testing  
M-FS-19292 B76-10546 06

**WELDING**

Improved photochemical etching of stainless steel  
MSC-19728 B76-10268 08  
Explosive-seam welding seals large pressure vessels  
LANGLEY-12132 B76-10588 08

**WELDING MACHINES**

Synchronized backside-weld follower  
M-FS-24454 B76-10272 08

**WHEEL BRAKES**

Powered wheel for aircraft  
LANGLEY-12053 B76-10411 07

**WHEELS**

Powered wheel for aircraft  
LANGLEY-12053 B76-10411 07

**WINCHES**

Cable-load equalization system  
MSC-17494 B76-10230 06

**WIND DIRECTION**

Automatic fire/weather data station  
ARC-10993 B76-10160 02  
Wind velocity measurement  
M-FS-23362 B76-10172 03  
Portable, wind sensitive directional air sampler  
LEWIS-12743 B76-10489 03

**WIND MEASUREMENT**

Wind velocity measurement  
M-FS-23362 B76-10172 03  
Wingtip smoke generator  
ARC-10905 B76-10373 06

**WIND PROFILES**

Wingtip smoke generator  
ARC-10905 B76-10373 06

**WIND SHEAR**

Airport laser-Doppler  
M-FS-23423 B76-10174 03

**WIND TUNNEL APPARATUS**

Fast pressure-sensor system  
LANGLEY-12003 B76-10087 06

**WIND VANES**

Spin-rate control device  
ARC-10884 B76-10417 07

**WIND VELOCITY MEASUREMENT**

Automatic fire/weather data station  
ARC-10993 B76-10160 02  
Wind velocity measurement  
M-FS-23362 B76-10172 03

**WINDING**

Metal structures with parallel pores  
GSFC-10984 B76-10131 08

**WING CAMBER**

Trimmed noncoplanar planforms with minimum vortex drag  
LANGLEY-12121 B76-10566 06

**WING LOADING**

Trimmed noncoplanar planforms with minimum vortex drag  
LANGLEY-12121 B76-10566 06

**WING OSCILLATIONS**

Wingtip smoke generator  
ARC-10905 B76-10373 06

**WING PROFILES**

Swept wing aerodynamics  
ARC-10790 B76-10403 06

**WINGS**

WING Calculating lightning-induced voltages in electrical circuits within an aircraft wing  
LEWIS-12108 B76-10351 03

**WIRE**

Electrical-cable design guide  
M-FS-24280 B76-10157 01  
Multiple-layer printed-wiring trace connector  
LANGLEY-11709 B76-10305 01

**WIRING**

Plug-in light switches  
M-FS-24183 B76-10001 01  
Electrical-conduit sizing gage  
MSC-19491 B76-10150 01  
Testing flat-conductor cable  
M-FS-23174 B76-10151 01  
Surface mounted flat-conductor cable  
M-FS-223135 B76-10152 01  
Temperature rise of installed FCC  
M-FS-23127 B76-10153 01  
Electrical-splicing connector  
M-FS-24254 B76-10300 01

**WORK FUNCTIONS**

Hybrid-mode thermionic converter  
HQN-10876 B76-10056 03

**WRENCHES**

Hand and power tools  
HQN-10892 B76-10257 07  
High-torque open-end wrench  
NPO-13541 B76-10405 07

**X****X RAY APPARATUS**

Optics and lasers  
HQN-10893 B76-10187 03  
Containerless processing of tungsten  
M-FS-23509 B76-10422 08  
X-ray sensitive oblique imaging device  
GSFC-11935 B76-10504 03

**X RAY INSPECTION**

Faster X-ray analysis of semiconductor wafers  
M-FS-23315 B76-10225 06  
Nondestructive interior examination of moving parts  
M-FS-23378 B76-10545 06

**X RAY SPECTROSCOPY**

Shadow mask for X-ray spectrometer  
GSFC-12131 B76-10348 03

**X RAY TELESCOPES**

Polishing technique for beryllium mirror  
M-FS-22923 B76-10049 03

**X RAYS**

Microchannel detector array for X-rays and UV  
M-FS-23324 B76-10053 03

**X-Y PLOTTERS**

Manual dexterity evaluator  
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NPO-13644 B76-10075 05
- FELL, D M**  
Flexible-pile thermal sealant  
MSC-19568 B76-10371 06
- FELLER, A**  
Economical custom LSI arrays  
M-FS-23262 B76-10004 01
- FELTNER, W R**  
IGFET/SOI fabrication method  
M-FS-23312 B76-10259 08
- FERRIS, D F**  
Long-life ball-valve design  
M-FS-19282 B76-10576 07
- FESLER, L W**  
Multidimensional heat conduction  
MSC-16159 B76-10509 03
- FICKEY, E W**  
Field sampling fine-vacuum system  
KSC-10596 B76-10118 07
- FIELDS, B**  
Digital image-rectification system  
GSFC-12156 B76-10513 03
- FINK, L C**  
Systems improved numerical differencing analyzer  
MSC-13805 B76-10609 09
- FISHER, D M**  
Ultrasonic monitoring of crack extension  
LEWIS-12632 B76-10547 06
- FISHER, R L**  
Ironless-armature brushless motor  
GSFC-11880 B76-10476 02
- FISHER, R R**  
Self-contained constant-temperature heat absorber  
M-FS-22989 B76-10091 06
- FITTES, B A**  
Selective image enhancement  
M-FS-23364 B76-10021 02
- FITZGERALD, F C**  
Biased-circuit digital data line receiver  
MSC-14967 B76-10457 01
- FLEETWOOD, C M, JR**  
Elimination of color rings on film negatives  
GSFC-12110 B76-10498 03
- FLOYD, S R**  
Light pipes for LED measurements  
GSFC-11887 B76-10034 03  
Beam patterns of light-emitting diodes  
GSFC-11890 B76-10040 03
- FOERSTER, G**  
Pressure tube instrumentation  
LEWIS-12539 B76-10101 06
- FONTECCHIO, P L**  
Low-pressure-gas sampling pump  
ARC-10941 B76-10573 07
- FORESTIERI, A F**  
Reduced costs for solar-cell modules  
LEWIS-12185 B76-10427 08
- FOSTER, C F**  
Wideband distribution amplifier  
NPO-13256 B76-10307 01
- FOSTER, J A**  
Paddle-pin alignment test  
KSC-10740 B76-10388 06
- FOSTER, J N**  
Determination of trace amounts of POF3  
LEWIS-10577 B76-10356 04
- FRANKS, H H**  
Miniature emergency oxygen unit  
KSC-11011 B76-10539 05
- FRAREY, J L**  
Pump failure monitor  
M-FS-23366 B76-10219 06
- FRAZIER, C**  
Catalysts for low-energy aldehyde processes  
NPO-13827 B76-10519 04

- FREEMAN, E. R., JR**  
Elastrostatic-discharge damage to semiconductors  
LANGLEY-11739 B76-10586 08
- FROECHTENIGT, J. F**  
Polishing technique for beryllium mirror  
M-FS-22923 B76-10049 03
- FROST, J. D., JR**  
Disposable biomedical electrode  
MSC-14623 B76-10363 05  
Automated EEG acquisition  
MSC-16111 B76-10364 05
- FROST, R. T**  
Containerless processing of tungsten  
M-FS-23509 B76-10422 08
- FURUIKE, T**  
Transpose of finite-element data  
MSC-19644 B76-10564 06
- FYMAT, A. L**  
A forward-scatter polarimeter for chemical analysis  
NPO-13756 B76-10334 03
- G**
- GAINER, P. A**  
Manual dexterity evaluator  
LANGLEY-12022 B76-10209 05
- GALLO, E. A**  
Split-ring seal  
MSC-14304 B76-10247 07
- GALOVICH, P**  
Energy-absorbing attenuator  
MSC-17473 B76-10419 07
- GALVAS, M. R**  
Improved automobile gas turbine engine  
LEWIS-12521 B76-10115 07
- GANGE, R. A**  
Permanent holographic storage medium  
M-FS-22588 B76-10044 03  
Electrode structure for uniform corona discharge  
M-FS-22617 B76-10045 03
- GANT, G**  
A nonsaturating dc-to-dc parallel power converter  
GSFC-12047 B76-10290 01
- GARDNER, A. H**  
Computer-automated ultrasonic inspection system  
M-FS-23338 B76-10217 06
- GASSAWAY, J. D**  
Electrostatic analysis of charge-coupled structures  
M-FS-23507 B76-10472 01
- GAVALER, J. R**  
Ultra-high-vacuum electrical feedthrough  
HQN-10799 B76-10005 01
- GEDNEY, R. T**  
All-weather ice information system  
LEWIS-12638 B76-10018 02
- GEORGE, P. K**  
New passive replicator for bubble domain devices  
LANGLEY-11997 B76-10442 01  
Multiple-bubble detector  
LANGLEY-12043 B76-10444 01
- GERLACH, R. H**  
DC drive system for cine/pulse cameras  
MSC-16085 B76-10497 03
- GEYSER, L. C**  
Linear stochastic optimal control and estimation  
LEWIS-12505 B76-10134 09
- LEWIS-12505** B76-10134 09
- GIANDOMENICO, A**  
High-torque open-end wrench  
NPO-13541 B76-10405 07
- GIFFIN, C. E**  
Double-focusing mass spectrometer  
NPO-13663 B76-10183 03
- GIGANTE, J. R**  
Solid-state particle detectors  
GSFC-11785 B76-10142 01
- GILBREATH, W. P**  
Stress-corrosion cracking due to hydrazine  
ARC-11093 B76-10526 04
- GILES, G. L**  
Oblique orthographic projections and contour plots  
LANGLEY-11877 B76-10601 09
- GILLEY, C. R**  
Stopping small liquid leaks  
KSC-10667 B76-10126 08
- GILLIAM, D. M**  
Paddle-pin alignment test  
KSC-10740 B76-10388 06
- GILLON, W. A., JR**  
Improved cryogenic shaft seals  
M-FS-19153 B76-10080 06  
Long-life ball-valve design  
M-FS-19282 B76-10576 07
- GIORGINI, E. A**  
Firefighter's breathing system  
MSC-14733 B76-10208 05
- GLASSMAN, A. J**  
Predicting off-design performance of radial-inflow turbines  
LEWIS-12500 B76-10242 06  
Design analysis of radial-inflow turbines  
LEWIS-12684 B76-10561 06
- GLOSS, B. B**  
Estimating subsonic aerodynamic characteristics of complex planforms  
LANGLEY-11047 B76-10565 06
- GOLDSTEIN, R. J**  
Noncontaminating method for visualizing gas flow  
LEWIS-12076 B76-10088 06
- GONZALEZ, R. C**  
Selective image enhancement  
M-FS-23364 B76-10021 02
- GOODRICH, W. D**  
One-wire thermocouple  
MSC-16220 B76-10556 06  
Aluminum transfer method for plating plastics  
MSC-16221 B76-10593 08
- GOODWIN, M. A**  
Code-usage analysis system  
MSC-16214 B76-10603 09
- GORDON, L. H**  
Microprogramed telemetry processor  
ARC-11061 B76-10460 01
- GOSS, W. C**  
Improved resolution for sensor arrays  
NPO-13745 B76-10439 01
- GRAFF, S. M**  
Reliability of hybrid microcircuit bonding  
M-FS-23358 B76-10129 08
- GRANA, D. C**  
Remote water-monitoring system  
LANGLEY-11973 B76-10365 05
- GRANT, C**  
Video display synthesizer  
MSC-14620 B76-10052 03
- GRAULING, C. H., JR**  
Duplex switch  
LANGLEY-11546 B76-10448 01
- GRAY, D. L**  
Miniature-angular-position transducer  
LANGLEY-11999 B76-10555 06
- GRAY, H. B**  
Catalysts for low-energy aldehyde processes  
NPO-13827 B76-10519 04
- GREEN, B. E.**  
Interlocking butterfly tourniquet  
MSC-19382 B76-10532 05
- GREEN, G. E., JR**  
All-tantalum electrolytic capacitor  
M-FS-23462 B76-10424 08
- GREEN, K. A**  
Multifrequency, broadband, dual-polarized antenna  
NPO-13866 B76-10464 01
- GREGORY, R. W**  
Portable solar radiometer measures stack-plume effluents  
LANGLEY-12123 B76-10491 03
- GRIFFITH, J. S**  
Automated solvent concentrator  
NPO-13068 B76-10198 04
- GROOVER, J. L.**  
Information retrieval and display system  
M-FS-23510 B76-10606 09
- GROSS, C**  
Fast pressure-sensor system  
LANGLEY-12003 B76-10087 06
- GROSS, K. W**  
Integral-matrix procedure for boundary-layer problems  
M-FS-23348 B76-10608 09
- GRUNBAUM, B. W**  
Automatic multiple applicator electrophoresis  
ARC-10991 B76-10538 05
- GUBIN, R. S**  
Miniature emergency oxygen unit  
KSC-11011 B76-10539 05
- GUISINGER, J. E**  
Analog data recording on MnBi film  
NPO-13302 B76-10175 03
- GUMAN, W. J**  
Propellant side feed  
LANGLEY-11082 B76-10094 06
- GUMBS, R. W**  
Coating for solar panels  
M-FS-23420 B76-10196 04
- GUPTA, A**  
Catalysts for low-energy aldehyde processes  
NPO-13827 B76-10519 04
- GUTHRIE, R. J**  
Fuel-cell powerplant insulation  
MSC-16012 B76-10426 08
- GUYAN, R. J**  
NASTRAN component-mode synthesis  
MSC-19632 B76-10104 06
- H**
- HAFTKA, R. T**  
Analysis of axisymmetric shell structure  
LANGLEY-12059 B76-10398 06
- HAINES, R. F**  
Visual projection reticle  
ARC-10976 B76-10590 08

**HALBACH, C R**

Improved high-temperature heater with stabilized-zirconia elements  
M-FS-23351 876-10221 06

**HALL, W J**

Cavitating performance of pumping machinery  
LEWIS-12423 876-10394 06

**HALLAM, K L**

X-ray sensitive oblique imaging device  
GSFC-11935 876-10504 03

**HALSTEAD, D W**

BUCLAP2  
LANGLEY-11696 876-10111 06

**HAMM, R W**

Contouring randomly spaced data  
LANGLEY-12044 876-10436 09

**HANKINS, J D**

Surface mounted flat-conductor cable  
M-FS-223135 876-10152 01  
Temperature rise of installed FCC  
M-FS-23127 876-10153 01  
Flat-conductor cable baseboard  
M-FS-23141 876-10154 01  
Relative stiffness of flat-conductor cable  
M-FS-23537 876-10469 01

**HANNA, M F**

Solid-state RF switch  
NPO-13081 876-10315 01

**HARDY, D H**

Inexpensive low-voltage solid-state alarm  
LEWIS-12544 876-10320 02

**HARDY, W N**

Temperature reference for microwave radiometer calibration  
LANGLEY-11355 876-10503 03

**HARNETT, L N**

Monitor for optical-window contamination  
ARC-10947 876-10345 03

**HARRIGILL, W T, JR**

DC-to-DC conversion with voltage multipliers  
LEWIS-12297 876-10138 01

**HARRIS, J M**

Detecting contamination on a metal surface  
M-FS-19260 876-10552 06

**HARRIS, R F**

Borosilicate glass-to-Kovar tube bonding  
GSFC-12077 876-10278 08

**HARRISON, E S**

Polymeric foams stable at high temperatures  
ARC-11008 876-10065 04

**HART, R K**

Improved Einzel lenses  
M-FS-23115 876-10032 03

**HARVEY, C A**

Optimal insensitive-controller synthesis  
M-FS-21666 876-10103 06

**HASSELL, J A**

Chemiluminescent prediction of service life  
MSC-16010 876-10191 04

**HATFIELD, J N**

Data-management and information system  
NPO-13716 876-10602 09

**HAWKINS, R O**

Ultra-lightweight pressure vessels  
MSC-14983 876-10266 08

**HAWRYLO, F Z**

Low-threshold light-emitting-diode laser  
LANGLEY-11477 876-10176 03  
Semiconductor ohmic contact  
LANGLEY-11691 876-10461 01

**HAYES, J D**

Passive thermal-control coatings  
M-FS-22794 876-10071 04

**HAYNES, D P**

Remote water-monitoring system  
LANGLEY-11973 876-10365 05

**HEDGES, S R**

Low-cost pressure-data encoder  
NPO-13692 876-10303 01

**HEFFRON, C J**

Impact of a solid body with water  
M-FS-23512 876-10560 06

**HEFLINGER, L O**

Spatial filter for Q-switched laser  
LEWIS-12164 876-10501 03  
Dual-purpose holocamera  
LEWIS-12166 876-10505 03

**HEIGHWAY, J E**

All-weather ice information system  
LEWIS-12638 876-10018 02

**HEIMBUCH, A H**

Inexpensive portable drug detector  
ARC-10633 876-10534 05

**HEISMAN, R M**

Repair of fused silica platens  
MSC-19713 876-10276 08

**HENDERSON, B D**

Miniature carbon dioxide sensor  
MSC-16009 876-10344 03

**HENDLER, D R**

MINIVER Miniature version of real/ideal gas aero-heating and ablation computer program  
M-FS-21951 876-10105 06

**HENRY, E C**

Nucleation of electronic-crystal regions  
M-FS-23049 876-10524 04

**HENRY, R D**

Triple-layer bubble-domain film  
LANGLEY-11755 876-10006 01

**HENRY, R H**

Reducing cold flow in elastomeric O-rings  
M-FS-24336 876-10086 06

**HEPPNER, D B**

Electro-optical liquid depth sensor  
M-FS-22921 876-10024 02

**HERNDON, R H**

Testing flat-conductor cable  
M-FS-23174 876-10151 01

**HERZIG, H**

Low-reflectivity spectrally selective coating  
GSFC-12114 876-10184 03

**HEYMAN, J S**

Rous system  
LANGLEY-12015 876-10215 06  
ROUS bolt-tensioning monitor  
LANGLEY-12016 876-10216 06

**HIGHLEY, K G**

Compressed air cylinder pallet  
MSC-19217 876-10203 04

**HILBERT, E E**

Advanced imaging communication system  
NPO-13545 876-10482 02

**HILL, J W**

Infrared range sensor  
ARC-10885 876-10475 02

**HILLMAN, C E, JR**

Disposable biomedical electrode  
MSC-14623 876-10363 05

Automated EEG acquisition

MSC-16111 876-10364 05

**HINK, G**

Stability of an elastic airplane  
ARC-11086 876-10568 06

**HIRSCHBERG, M H**

Resistance heating elements with specific heating profiles  
LEWIS-10719 876-10095 06

**HOBART, H F**

Automated secondary standard for liquid flowmeters  
LEWIS-12695 876-10544 06

**HOCKENBERGER, R W**

Interleaved cyclic codes  
KSC-11040 876-10435 09

**HODGES, B C**

Meta-assembler  
M-FS-23449 876-10437 09

**HOFFLER, G W**

Occlusive-cuff controller  
MSC-14836 876-10207 05

**HOFFMAN, C E**

Introducing controlled matter into a fluid system  
M-FS-24309 876-10093 06

**HOLBROOK, R J**

Parylene coating for circuit components  
M-FS-23450 876-10583 08

**HOLDEMAN, L B**

Improved microbridge Josephson devices  
M-FS-23274 876-10012 01

**HOLDEN, C F**

Flange weld pressure testing  
M-FS-19292 876-10546 06

**HOLDEN, R G**

Elimination of thermally generated EMF s on PC boards  
MSC-16125 876-10594 08

**HOLLADAY, A M**

Improved collimator for imaging system  
M-FS-22863 876-10038 03

**HOLLAHAN, J R**

Abrasion-resistant coatings for plastic surfaces  
ARC-10915 876-10201 04

**HOLMES, A D**

All-weather ice information system  
LEWIS-12638 876-10018 02

**HOLSTON, A A, JR**

General instability analysis  
M-FS-23407 876-10563 06

**HOLT, J D**

Manual dexterity evaluator  
LANGLEY-12022 876-10209 05

**HOLT, J W**

Hot-wire tile removal tool  
KSC-11043 876-10433 08

**HONEYCUTT, J O**

Polymer adhesives for hybrid circuits  
M-FS-23287 876-10015 01

**HORD, J**

Cavitating performance of pumping machinery  
LEWIS-12423 876-10394 06

**HORSLEY, P H**

Code-usage analysis system  
MSC-16214 876-10603 09

**HOUSLEY, R M**

Reduction of acoustic losses by outgassing  
MSC-15985 876-10069 04

**HOUTE, F A**

Vacuum-jacketed line spacer  
MSC-14365 876-10083 06

- HOWARD, W H**  
In vivo bone-strain telemetry  
ARC-11074 876-10535 05
- HOWARTH, J T**  
Flame-resistant elastomeric polymers  
MSC-16078 876-10357 04
- HRUBY, R J**  
Capacitive shaft-angle encoder  
ARC-10897 876-10386 06
- HRUZAK, G A**  
Meal system for the elderly  
MSC-16062 876-10530 05
- HSU, G C**  
Surfactant-assisted coal liquefaction  
NPO-13904 876-10517 04
- HUANG, C C**  
Airport laser-Doppler  
M-FS-23423 876-10174 03
- HUEY, D C**  
Manchester transition tracking loop (MTTL)  
MSC-14842 876-10319 02
- HUFFAKER, R M**  
Laser-Doppler measurement of air turbulence  
M-FS-23155 876-10031 03  
Wind velocity measurement  
M-FS-23362 876-10172 03
- HUGGINS, C T**  
Improved collimator for imaging system  
M-FS-22863 876-10038 03
- HUMPHREY, M F**  
Extracting lignins from mill wastes  
NPO-13847 876-10514 04
- HURLEY, W J**  
Tool removes brazed fittings  
LANGLEY-10944 876-10244 07
- HURSTA, W**  
Occlusive-cuff controller  
MSC-14836 876-10207 05
- HUSTED, R R**  
Extraction of urea and ammonium ion  
ARC-11064 876-10515 04
- I**
- ICELAND, W F**  
Synchronized backside-weld follower  
M-FS-24454 876-10272 08
- ILIFF, K W**  
Determining aircraft stability and control derivatives  
FRC-10109 876-10402 06
- INGHAM, J D**  
Low-temperature thermoluminescence  
NPO-11935 876-10193 04  
Less-costly activated carbon for sewage treatment  
NPO-13877 876-10516 04
- IRICK, S C**  
Exercise support for therapy  
LANGLEY-11975 876-10074 05  
Powered wheel for aircraft  
LANGLEY-12053 876-10411 07
- J**
- JACOB, D S**  
Constant-rate fluid-delivery system  
MSC-14905 876-10214 06
- JACOBS, G L**  
Removal of encapsulating materials  
GSFC-11696 876-10143 01
- JACOBS, S F**  
Precision measurement of changes in physical dimensions  
M-FS-23527 876-10543 06
- JAGOW, R B**  
Catalytic oxidation of waste materials  
MSC-14831 876-10354 04
- JAHNSEN, V J**  
Precolumn for extract concentration  
NPO-13083 876-10199 04
- JAN, L**  
A nonsaturating dc-to-dc parallel power converter  
GSFC-12047 876-10290 01
- JANOCKO, M A**  
Ultra-high-vacuum electrical feedthrough  
HQN-10799 876-10005 01
- JIRBERG, R J**  
All-weather ice information system  
LEWIS-12638 876-10018 02
- JOHNSEN, E G**  
Tracking system for moving subjects  
HQN-10880 876-10028 02
- JOHNSON, C B**  
X-ray sensitive oblique imaging device  
GSFC-11935 876-10504 03
- JOHNSON, C C**  
Membrane has high urea-rejection properties  
ARC-10980 876-10518 04
- JOHNSON, J A**  
Miniature emergency oxygen unit  
KSC-11011 876-10539 05
- JOHNSON, R L**  
Integral fan/water separator  
MSC-14756 876-10119 07
- JOLLEY, J**  
Low-cost solar reflectors  
NPO-13707 876-10123 08
- JONES, A C**  
Temperature reference for microwave radiometer calibration  
LANGLEY-11355 876-10503 03
- K**
- KALAFUT, J S**  
Vidicon intensifier  
NPO-11912 876-10054 03
- KALLMAN, B J**  
Leak testing glass ampoules  
LANGLEY-11988 876-10551 06
- KALVINSKAS, J J**  
Less-costly activated carbon for sewage treatment  
NPO-13877 876-10516 04
- KAPUSTKA, R E**  
Compact reconditioner for Ni/Cd cells  
M-FS-23270 876-10141 01
- KATSANIS, T**  
Improved automobile gas turbine engine  
LEWIS-12521 876-10115 07
- KATZBERG, S J**  
Optical profilometer  
LANGLEY-11869 876-10338 03
- KEARNS, G B**  
Proposed low-temperature solar engine  
M-FS-23403 876-10254 07
- KEATHLEY, W H**  
Low-onset-rate energy absorber  
MSC-12279 876-10385 06
- KEESEY, M S W**  
Development ephemeris number 96  
NPO-14002 876-10507 03
- KEIR, A R**  
Transducer bonding kit  
MSC-19690 876-10587 08
- KELLEY, F G**  
Universal solar-cell terminal  
M-FS-23505 876-10450 01
- KELLY, W L**  
Solid-state turn-coordinator display  
LANGLEY-12090 876-10451 01
- KELLY, W L, IV**  
Optical profilometer  
LANGLEY-11869 876-10338 03
- KENKEL, J V**  
Detection of surface impurities on processed metals  
MSC-19670 876-10553 06
- KERLIN, E E**  
Computer-automated ultrasonic inspection system  
M-FS-23338 876-10217 06
- KESSLER, L L**  
Power-control switch  
M-FS-23395 876-10148 01
- KEYES, J W**  
Shock interference patterns and heating  
LANGLEY-11497 876-10240 06
- KHANDELWAL, G S**  
Proton tissue dose  
LANGLEY-11802 876-10078 05
- KIBLER, J F**  
Contouring randomly spaced data  
LANGLEY-12044 876-10436 09
- KICHAK, R A**  
Active inrush-current limiter  
GSFC-11789 876-10467 01
- KIEFLING, L**  
SPAR Structural-performance analysis and redesign  
LANGLEY-12062 876-10399 06
- KILLEN, H B**  
Signal enhancement filters  
MSC-14907 876-10453 01
- KIM, Y G**  
Determining eutectic composition in metal alloys  
LEWIS-12633 876-10520 04
- KING, R B**  
Portable, wind sensitive directional air sampler  
LEWIS-12743 876-10489 03
- KING, W L**  
Information retrieval and display system  
M-FS-23510 876-10606 09
- KINSEY, D L**  
Reliability of hybrid microcircuit bonding  
M-FS-23358 876-10129 08
- KIRBY, C E**  
Economical solar-heating for homes  
LANGLEY-12135 876-10571 07
- KIRKPATRICK, J P**  
'Thermal-diode' heat pipe  
ARC-10997 876-10223 06
- KLEINBERG, L L**  
UHF/microwave oscillator/amplifier  
GSFC-12113 876-10455 01
- KLEIR, R**  
FORTRAN code-evaluation system  
M-FS-23539 876-10604 09
- KLIMAN, S J**  
Ultrasonic monitoring of crack extension  
LEWIS-12632 876-10547 06

**KLINGMAN, E. E., III**

- Calibration of image dissector tubes  
M-FS-22208 876-10055 03
- KNOELL, A. C.**  
Graphite-reinforced bone cement  
NPO-13764 876-10211 05
- KOBAYASHI, H. S.**  
Unbalanced quadruphase demodulator  
MSC-14840 876-10161 02  
Tracking a phase-shift-keyed signal  
MSC-16170 876-10481 02
- KOBAYASHI, T.**  
New passive replicator for bubble domain devices  
LANGLEY-11997 876-10442 01
- KOCMOND, W. C.**  
Fluid classifier and disseminator  
HQN-10748 876-10089 06
- KOENIGSBERG, E.**  
In vivo bone-strain telemetry  
ARC-11074 876-10535 05
- KOFSKEY, M. G.**  
Improved automobile gas turbine engine  
LEWIS-12521 876-10115 07
- KOHMAN, W. E.**  
Pointing control/roll positioning mechanism  
M-FS-22809 876-10121 07
- KOLBLY, R. B.**  
Low-cost pressure-data encoder  
NPO-13692 876-10303 01  
Direct-reading inductance meter  
NPO-13792 876-10473 02
- KOSSON, R.**  
'Thermal-diode' heat pipe  
ARC-10997 876-10223 06
- KRAEMER, E.**  
Fabrication of ultra-low-noise amplifier  
GSFC-12186 876-10596 08
- KRAEMER, W.**  
Video simulator with electronic ranging  
MSC-14965 876-10474 02
- KRAMER, G. P.**  
Simplified deflection-coil linearity testing  
M-FS-23400 876-10180 03
- KRAMER, K.**  
Roll-forming tubes to header plates  
LEWIS-10513 876-10130 08
- KRAUSE, M. C.**  
Wind velocity measurement  
M-FS-23362 876-10172 03  
Airport laser-Doppler  
M-FS-23423 876-10174 03
- KRESSEL, H.**  
Low-threshold light-emitting-diode laser  
LANGLEY-11477 876-10176 03  
Semiconductor ohmic contact  
LANGLEY-11691 876-10461 01
- KROGH, F. T.**  
Guide for testing numerical-integration subroutines  
NPO-11644 876-10135 09
- KROSS, D. A.**  
Impact of a solid body with water  
M-FS-23512 876-10560 06
- KRUGER, R.**  
Quartz-crystal-oscillator hygrometer  
GSFC-12153 876-10349 03
- KUBACKI, R. M.**  
Antireflection coating for plastic lenses  
ARC-10983 876-10591 08
- KUBOKAWA, C. C.**  
Viscoelastic foam cushion  
ARC-11089 876-10525 04

**KUNSELMAN, J. S.**

- Computer-automated ultrasonic inspection system  
M-FS-23338 876-10217 06

**L****LADERMAN, A.**

- All-digital sequence correlator  
NPO-13737 876-10468 01

**LAGER, J. R.**

- General instability analysis  
M-FS-23407 876-10563 06

**LAMAR, J. E.**

- Estimating subsonic aerodynamic characteristics of complex planforms  
LANGLEY-11047 876-10565 06  
Trimmed noncoplanar planforms with minimum vortex drag  
LANGLEY-12121 876-10566 06

**LANE, A. L.**

- Tunable acoustical optical filter  
NPO-13640 876-10340 03

**LAPINTA, C. K.**

- Physician's modern 'Black Bag'  
MSC-14936 876-10212 05

**LAUVER, R. W.**

- Solar selective surfaces  
LEWIS-12614 876-10047 03

**LAVIGNA, T.**

- A nonsaturating dc-to-dc parallel power converter  
GSFC-12047 876-10290 01

**LAWRENCE, T. R.**

- Wind velocity measurement  
M-FS-23362 876-10172 03  
Airport laser-Doppler  
M-FS-23423 876-10174 03

**LAWSON, D. D.**

- Thermoluminescence for forensic analysis  
NPO-11607 876-10192 04  
Low-temperature thermoluminescence  
NPO-11935 876-10193 04

**LEE, A. L.**

- Multispecies transient simulator  
MSC-14862 876-10527 04  
Thermal-radiation model  
M-FS-23538 876-10562 06

**LEE, R. D.**

- Biomedical ultrasonoscope  
ARC-10994 876-10537 05

**LEE, S. H.**

- Contrast enhancement of transparencies  
GSFC-11989 876-10181 03

**LEE, Y. S.**

- Optimal insensitive-controller synthesis  
M-FS-21666 876-10103 06

**LEEB, W.**

- Beam splitter/combiner  
GSFC-12083 876-10177 03

**LEEPER, J.**

- Fabrication of ultra-low-noise amplifier  
GSFC-12186 876-10596 08

**LEHTINEN, B.**

- Control system design  
LEWIS-12556 876-10404 06

**LEHTINEN, F. K. B.**

- Linear stochastic optimal control and estimation  
LEWIS-12505 876-10134 09  
Linear stochastic optimal control and estimation  
LEWIS-12540 876-10607 09

**LEIBOWITZ, L. P.**

- Shock-tube driver  
NPO-13528 876-10090 06

**LEMONS, C. R.**

- 3-D foam adhesive deposition  
M-FS-22739 876-10271 08

**LEMONS, F. R.**

- All-nickel hot-wire probe  
ARC-10911 876-10379 06

**LENETT, S. D.**

- Tracking a phase-shift-keyed signal  
MSC-16170 876-10481 02

**LENT, W. E.**

- Enamel for high-temperature superalloys  
M-FS-22804 876-10358 04

**LEVIN, H.**

- Enamel for high-temperature superalloys  
M-FS-22804 876-10358 04

**LEVITT, B. K.**

- Long binary frame sync words  
NPO-13727 876-10163 02

**LEVITT, I. M.**

- Document restoration by computer techniques  
HQN-10910 876-10597 09

**LEWICKI, G. W.**

- Readout method for stored information  
NPO-13243 876-10029 02  
Analog data recording on MnBi film  
NPO-13302 876-10175 03

**LEWIS, G. W.**

- Myocardial wall-thickness transducer  
NPO-13644 876-10075 05

**LIBER, T.**

- Mechanical loader for testing composites  
LEWIS-12432 876-10548 06

**LIBERTONE, C.**

- Rotary broaches  
M-FS-23374 876-10248 07

**LICARI, J. J.**

- Organic adhesives for hybrid microcircuits  
M-FS-23370 876-10014 01

**LIEBERMAN, S. L.**

- Transparent and flame-retardant potting compounds  
MSC-14669 876-10066 04

**LIGON, J.**

- Connector contact-ring bus  
MSC-19480 876-10146 01

**LIN, R. Y.**

- Thermal/acoustical insulation foam  
MSC-14795 876-10195 04

**LINDSEY, J. F.**

- Dielectric covered antennas  
MSC-16186 876-10471 01

**LINEBARIER, H. L.**

- Ablative-filled honeycomb composites  
LANGLEY-11180 876-10273 08

**LINFORD, R. M. F.**

- Ultraviolet fire detector  
M-FS-21577 876-10016 02

**Laser particulate spectrometer**

- MSC-14969 876-10331 03

**Vacuum-ultraviolet reflectometer**

- MSC-14995 876-10336 03

**Molecular beam generator**

- MSC-14996 876-10353 04

**LIPOMA, P. C.**

- Unichromatic-carrier color-TV system  
MSC-14683 876-10026 02

**LITTLES, J. W.**

- Solar heating and cooling performance  
M-FS-23432 876-10235 06

- LIVINGSTON, F R**  
Double-exposure holographic interferometer  
NPO-13796 876-10169 03
- LOCKMAN, N L**  
Electric heating for metal surface hardening  
M-FS-19268 876-10580 08
- LOECHEL, L W**  
Fracture mechanics for weld acceptance  
M-FS-23360 876-10282 08
- LOGGINS, R W**  
Testing flat-conductor cable  
M-FS-23174 876-10151 01
- LOMBARDI, T**  
Economical custom LSI arrays  
M-FS-23262 876-10004 01
- LONG, J J**  
Data-management and information system  
NPO-13716 876-10602 09
- LONG, M J**  
Exercise support for therapy  
LANGLEY-11975 876-10074 05  
Powered wheel for aircraft  
LANGLEY-12053 876-10411 07
- LOPEZ, H**  
Remote access of modem by digital control  
GSFC-11943 876-10022 02
- LOPEZ, R W**  
Self-contained constant-temperature heat absorber  
M-FS-22989 876-10091 06
- LORENTZ, R**  
Short-range biotelemetry system  
MSC-16011 876-10369 05
- LOTGERING, G E**  
Improved photochemical etching of stainless steel  
MSC-19728 876-10268 08
- LOTT, D A**  
Transducer bonding kit  
MSC-19690 876-10587 08
- LOVE, A W**  
Temperature reference for microwave radiometer calibration  
LANGLEY-11355 876-10503 03
- LUDWIG, L P**  
Cost saving synergistic shaft seal  
LEWIS-12119 876-10081 06  
Hydrodynamic lubrication of face seals  
LEWIS-12710 876-10558 06
- LUM, H, JR**  
Automatic fire/weather data station  
ARC-10993 876-10160 02  
Remote moisture-content balance  
ARC-11032 876-10492 03
- LUNDGREN, R A**  
Solid-state particle detectors  
GSFC-11785 876-10142 01
- LUTUS, P**  
Fluorescent dimming ballast  
MSC-14937 876-10292 01
- LYON, T F**  
Inexpensive leak-detector envelope  
LEWIS-11305 876-10084 06
- MA, L N**  
Manchester transition tracking loop (MTTL)  
MSC-14842 876-10319 02
- MAAG, W L**  
Solar heated and cooled office building  
LEWIS-12512 876-10395 06
- MACCORMACK, R W**  
Analytic numerical solutions for shock waves  
ARC-10959 876-10096 06
- MAGNUSSON, G O**  
Mechanical positioner  
MSC-15817 876-10245 07
- MAHAN, R E**  
Atmosphere-generating system  
MSC-14713 876-10389 06
- MAINE, R E**  
Determining aircraft stability and control derivatives  
FRC-10109 876-10402 06
- MANDEL, G**  
Safety organizations and experts  
LEWIS-12742 876-10598 09
- MANDELL, A**  
Rocking-motion sensor for the blind  
MSC-14805 876-10366 05
- MANHARDT, P D**  
COMOC a finite-element algorithm for the Navier-Stokes equations  
LANGLEY-11480 876-10241 06
- MANSFELD, F B**  
Purity test for copper-plating solutions  
M-FS-19298 876-10360 04  
Detection of surface impurities on processed metals  
MSC-19670 876-10553 06
- MARCUS, H L**  
Laser extensometer  
M-FS-19259 876-10030 03  
Detecting contamination on a metal surface  
M-FS-19260 876-10552 06  
Detection of surface impurities on processed metals  
MSC-19670 876-10553 06
- MARGASON, R J**  
Estimating subsonic aerodynamic characteristics of complex planforms  
LANGLEY-11047 876-10565 06
- MARINELLI, D P**  
Crystal orientation for solid-state photolithography  
LANGLEY-11940 876-10582 08
- MARING, L A**  
Modular multipurpose panel support  
MSC-19641 876-10421 08
- MARK, H**  
All-weather ice information system  
LEWIS-12638 876-10018 02
- MARKE, M L**  
Large-diameter fasteners of CRES alloy  
MSC-19313 876-10250 07
- MARLOW, R E**  
Concentric-tube differential drive  
M-FS-22707 876-10114 07
- MARTIN, H L**  
Hand fin for swimming  
M-FS-21632 876-10122 07
- MARTIN, M**  
Mask analysis program  
M-FS-23431 876-10318 01
- MARX, W.**  
RF shaping of silicon ribbon  
M-FS-23424 876-10258 08
- MARZEK, R A**  
Improved shelf for electronic modules  
NPO-13158 876-10578 07
- MASON, M D**  
A/D converter  
LANGLEY-11319 876-10009 01
- Charge-sensitive amplifier with notched frequency response  
LANGLEY-11317 876-10440 01
- MASTERS, G**  
Data-management and information system  
NPO-13716 876-10602 09
- MATSUMOTO, Y**  
Remote moisture-content balance  
ARC-11032 876-10492 03
- MAYNARD, V**  
Cleaning carbon steel  
KSC-10689 876-10275 08
- MCCLUNEY, W R**  
Economical measurement of particle concentration  
GSFC-12088 876-10332 03
- MCCLUNG, T M**  
Caution and warning system  
MSC-16046 876-10531 05
- MCDONALD, G**  
Solar selective surfaces  
LEWIS-12614 876-10047 03
- MCKEE, H B**  
Vacuum-jacketed line spacer  
MSC-14365 876-10083 06
- MCLAIN, A G**  
Rapid kinetics  
LANGLEY-12140 876-10529 04
- MCLALLIN, K L**  
Improved automobile gas turbine engine  
LEWIS-12521 876-10115 07
- MCLARTY, D M**  
Simplified explosive-weld evaluation  
MSC-14654 876-10228 06
- MCLAUGHLIN, P B**  
Firefighter's breathing system  
MSC-14733 876-10208 05
- MCLYMAN, W T**  
Toroidal converter core  
NPO-13413 876-10293 01  
Composite stacked moly-permalloy cores  
NPO-13578 876-10294 01  
Feedback arrangement for regenerative switches  
NPO-13060 876-10302 01  
Majority-voted logic fail-sense circuit  
NPO-13107 876-10313 01  
Simplified cut-core inductor  
NPO-13600 876-10317 01  
Transformer design tradeoffs  
NPO-13755 876-10470 01
- MEHMED, O**  
Pressure tube instrumentation  
LEWIS-12539 876-10101 06
- MENDENHALL, G D**  
Chemiluminescent prediction of service life  
MSC-16010 876-10191 04
- MEREDITH, B D**  
Solid-state turn-coordinator display  
LANGLEY-12090 876-10451 01
- MERWIN, R B**  
Serial-to-parallel color-TV converter  
MSC-14844 876-10027 02
- MESCH, H G**  
Solar cell electrical connections  
LEWIS-12293 876-10260 08
- MESCHKOW, S Z**  
Safety organizations and experts  
LEWIS-12742 876-10598 09
- MEYERING, H R**  
Receiver performance evaluator  
NPO-13701 876-10324 02

## M

**MEZRICH, R S**

- Voltage control for corona charging thermoplastics  
M-FS-23102 876-10043 03  
Hologram-reconstruction signal enhancement  
M-FS-23104 876-10343 03

**MEZZACAPPA, M A**

- Estimation of spares  
MSC-19469 876-10133 09

**MIKULLA, V**

- Hot-wire probe  
ARC-10900 876-10222 06

**MILBERGER, W E**

- Fluorescent-lamp power supply  
MSC-14900 876-10140 01

**MILLER, A J**

- Binary/BCD-to-ASCII data converter  
GSFC-12044 876-10322 02

**MILLER, C G**

- Atmospheric particle sampler  
NPO-13396 876-10059 04  
Continuous HCl in air indicator  
NPO-13474 876-10060 04  
Energy conversion system  
NPO-13510 876-10485 03  
Electrostatic-discharge ignition  
NPO-13798 876-10487 03

**MILLER, E R**

- Low-light-level integrating video system  
M-FS-23288 876-10347 03

**MILLMAN, L L**

- AC adapter for fuel-flow sensor  
GSFC-12037 876-10387 06

**MITCHELL, C L**

- Mask analysis program  
M-FS-23431 876-10318 01

**MITCHELL, M J**

- Combined joining process for dissimilar metals A concept  
MSC-19323 876-10127 08  
Diffusion brazing nickel-plated stainless steel  
MSC-19322 876-10265 08

**MOGAVERO, L**

- Document restoration by computer techniques  
HQN-10910 876-10597 09

**MOGAVERO, L N**

- Tracking system for moving subjects  
HQN-10880 876-10028 02

**MOOKHERJI, T K**

- Passive thermal-control coatings  
M-FS-22794 876-10071 04

**MOORE, R C**

- Open-loop digital frequency multiplier  
MSC-12709 876-10447 01

**MOORE, S F**

- Overload-protector/fault-indicator circuit  
NPO-13592 876-10308 01

**MORECROFT, J H**

- Interactive imaging and data processing  
NPO-13655 876-10167 02

**MORGAN, J E**

- Rocking-motion sensor for the blind  
MSC-14805 876-10366 05

**MORGAN, L E**

- Serial-data correlator/code translator  
KSC-11025 876-10454 01

**MORRIS, D J**

- Shock interference patterns and heating  
LANGLEY-11497 876-10240 06

**MORRIS, W D**

- Contouring randomly spaced data  
LANGLEY-12044 876-10436 09

**MORRISON, L K**

- Airport laser-Doppler  
M-FS-23423 876-10174 03

**MORRISON, T J**

- Annealing strained alloy 718  
M-FS-19242 876-10284 08

**MOSES, R A**

- Venting for condensation in gas lines  
MSC-19621 876-10109 06

**MOSSOLANI, D L**

- Leveling apparatus for precision instruments  
ARC-10981 876-10572 07

**MUELLER, C**

- Improved road handler  
M-FS-23233 876-10413 07

**MUELLER, R**

- Pressure tube instrumentation  
LEWIS-12539 876-10101 06

**MUELLER, R A**

- All-weather ice information system  
LEWIS-12638 876-10018 02

**MUELLER, W A**

- Less-costly activated carbon for sewage treatment  
NPO-13877 876-10516 04

**MULLINS, O**

- Electrolyte cells measure oxygen fugacities  
MSC-16089 876-10523 04

**MYERS, I T**

- DC-to-DC conversion with voltage multipliers  
LEWIS-12297 876-10138 01

**N****NAGLE, W J**

- Battery single-cell protection system  
LEWIS-12039 876-10306 01

**NATHAN, R**

- Interactive imaging and data processing  
NPO-13655 876-10167 02  
High-resolution electron microscope  
NPO-13811 876-10499 03

**NATHAN, R A**

- Chemiluminescent prediction of service life  
MSC-16010 876-10191 04

**NEELY, P L**

- Digital video image system  
M-FS-23322 876-10166 02  
Low-light-level integrating video system  
M-FS-23288 876-10347 03

**NELSON, S E**

- Tool removes brazed fittings  
LANGLEY-10944 876-10244 07

**NERHEIM, N M**

- Efficient copper-vapor pulsed laser  
NPO-13449 876-10341 03

**NEWHALL, X X**

- Development ephemeris number 96  
NPO-14002 876-10507 03

**NIER, A O**

- Double-focusing mass spectrometer  
NPO-13663 876-10183 03

**NIES, T**

- DIP extractor simplifies circuit removal  
MSC-12712 876-10002 01

**NOLTE, L J**

- Spin-rate control device  
ARC-10884 876-10417 07

**NORTON, M**

- Precision measurement of changes in physical dimensions  
M-FS-23527 876-10543 06

**NOSSEN, E J**

- Doppler extraction with a digital VCO  
MSC-14814 876-10452 01

**NOTO, R**

- Economical custom LSI arrays  
M-FS-23262 876-10004 01

**NOVAL, B A**

- Nucleation of electronic-crystal regions  
876-10524 04

**NUSSMEIER, T A**

- Analysis of laser heterodyne communications  
GSFC-12098 876-10511 03

**O****OBERIN, F W**

- Parylene coating for circuit components  
M-FS-23450 876-10583 08

**OEFFINGER, T R**

- A passive chevron replicator  
LANGLEY-11906 876-10441 01

**OEHRMAN, W I**

- Gust alleviation for STOL aircraft  
LANGLEY-11413 876-10099 06

**OHLHORST, C W**

- CONVERT Technique and computer program for calculating photographic film-density variations  
LANGLEY-11873 876-10057 03

**OKRESS, E C**

- Containerless processing of tungsten  
M-FS-23509 876-10422 08

**OLESON, C C**

- Reduction of computer power interruptions  
MSC-16136 876-10479 02

**OLSEN, O K**

- Reducing cold flow in elastomeric O-rings  
M-FS-24336 876-10086 06

**ORZECOWSKI, J A**

- COMOC a finite-element algorithm for the Navier-Stokes equations  
LANGLEY-11480 876-10241 06

**OSMUNDSON, J**

- Stabilized Nd YAG laser output  
GSFC-11571 876-10335 03

**OZARSKI, R**

- Standard aerosols for particle velocimeters  
M-FS-23075 876-10050 03

**P****PACKER, P N**

- Vacuum holddown fixture  
MSC-19666 876-10589 08

**PAGE, R J**

- Improved high-temperature heater with stabilized-zirconia elements  
M-FS-23351 876-10221 06

**PALMER, W L**

- Printed-circuit solar-cell array  
M-FS-23128 876-10007 01

**PALUKA, J R**

- Overload-protector/fault-indicator circuit  
NPO-13592 876-10308 01

- PARK, A C**  
Impact response analyses  
M-FS-23335 876-10559 06
- PARKER, A J**  
Thermal insulation for high-temperature systems  
GSFC-10954 876-10064 04
- PARKER, D L**  
Faster X-ray analysis of semiconductor wafers  
M-FS-23315 876-10225 06
- PARKER, J A**  
Inexpensive portable drug detector  
ARC-10633 876-10534 05
- PARKER, J T**  
Caution and warning system  
MSC-16046 876-10531 05
- PARKER, T W**  
Duplexer switch  
LANGLEY-11546 876-10448 01
- PASLAY, D**  
Oral annunciator with programmable vocabulary  
MSC-14798 876-10326 02
- PATELLA, F J**  
Microprogramming for real-time data acquisition  
KSC-11027 876-10328 02
- PATON, N E**  
Detection of surface impurities on processed metals  
MSC-19670 876-10553 06
- PATTEN, T C**  
Vacuum-jacketed line spacer  
MSC-14365 876-10083 06
- PAULLAY, A J**  
Analytic numerical solutions for shock waves  
ARC-10959 876-10096 06
- PAWLOWSKI, J F**  
Tracking a phase-shift-keyed signal  
MSC-16170 876-10481 02
- PECKINPAUGH, C J**  
Guidelines for multiple LSI packaging  
M-FS-23367 876-10159 01
- PELETIER, D P**  
Pulse amplitude discriminator threshold calibration  
GSFC-11912 876-10023 02
- PELHANK, D A**  
RF shaping of silicon ribbon  
M-FS-23424 876-10258 08
- PELLERIN, C J**  
Analog-to-binary conversion of video data  
GSFC-11918 876-10165 02
- PEOPLES, J A**  
Proposed low-temperature solar engine  
M-FS-23403 876-10254 07
- PERALA, R A**  
Low-power programmable high-voltage supply  
LANGLEY-11316 876-10458 01
- PERKINS, K L**  
Organic adhesives for hybrid microcircuits  
M-FS-23370 876-10014 01
- PERLMAN, M**  
M-ary shift register  
NPO-11868 876-10011 01
- PERRY, W E**  
Color to black-and-white converter  
MSC-12618 876-10346 03
- PETERS, P N**  
Improved microbridge Josephson devices  
M-FS-23274 876-10012 01
- Ellipsometer for measurement in ultrahigh vacuum  
M-FS-23130 876-10035 03
- PETERSON, P D**  
Caution and warning system  
MSC-16046 876-10531 05
- PETTUS, R O**  
Contamination monitoring of fluids  
KSC-11037 876-10382 06
- PHELPS, G A**  
Electrical-cable design guide  
M-FS-24280 876-10157 01
- PICCILOLO, G L**  
Quantitative bioluminescent detection of bacteria  
GSFC-12003 876-10073 05  
Fast measurement of bacterial susceptibility to antibiotics  
GSFC-10246 876-10536 05
- PIETRZYK, J P**  
Vidicon intensifier  
NPO-11912 876-10054 03
- PILLAI, P K C**  
Fabrication and applications of electrets  
M-FS-23437 876-10429 08
- PINTO, J J**  
Safety organizations and experts  
LEWIS-12742 876-10598 09
- PITTMAN, C M**  
Multilayer insulative systems  
LANGLEY-12057 876-10528 04
- PIVIROTTI, T J**  
Efficient copper-vapor pulsed laser  
NPO-13449 876-10341 03
- PIZZECK, D E**  
Multiple-layer printed-wiring trace connector  
LANGLEY-11709 876-10305 01
- PLUMER, J A**  
WING Calculating lightning-induced voltages in electrical circuits within an aircraft wing  
LEWIS-12108 876-10351 03
- POFERL, D**  
Noncontaminating method for visualizing gas flow  
LEWIS-12076 876-10088 06
- POLENTZ, P P**  
Stability of an elastic airplane  
ARC-11086 876-10568 06
- POLHEMUS, J T**  
Rocking-motion sensor for the blind  
MSC-14805 876-10366 05
- PORTER, W A**  
Faster X-ray analysis of semiconductor wafers  
M-FS-23315 876-10225 06
- POSEY, D L**  
Radial level  
LANGLEY-11982 876-10246 07
- PRATT, J R**  
Novel aminobenzyl and imidobenzyl benzenes  
LANGLEY-11843 876-10058 04
- PRIMEAUX, G R**  
Meal system for the elderly  
MSC-16062 876-10530 05
- PRITCHARD, R P**  
Door latch with through-access hole  
MSC-19634 876-10414 07
- PRYOR, R L**  
CMOS-compatible tristate cable driver  
M-FS-23410 876-10149 01
- PUCCINELLI, E**  
Digital image-rectification system  
GSFC-12156 876-10513 03
- PUTNAM, L E**  
Swept-tapered-wing aerodynamics  
LANGLEY-11701 876-10112 06
- PUTNAM, T W**  
Relative humidity from psychrometric data  
FRC-10108 876-10285 09
- PUTNEY, B**  
GEODYN Orbital and geodetic parameter estimation  
GSFC-12014 876-10396 06

## Q

- QUINN, R B**  
Waveguide-to-coax transition/low-pass filter  
NPO-13642 876-10147 01

## R

- RAGGIO, L J**  
Interlocking butterfly tourniquet  
MSC-19382 876-10532 05
- RAMONDETTA, P**  
Economical custom LSI arrays  
M-FS-23262 876-10004 01
- RAMSEY, C R**  
Data system for multiplexed water-current meters  
M-FS-23343 876-10493 03
- RANSOM, F E**  
Method of removing drilling chips  
M-FS-19235 876-10262 08
- RAO, C S R**  
Rapid kinetics  
LANGLEY-12140 876-10529 04
- RASOR, N S**  
Hybrid-mode thermionic converter  
HQN-10876 876-10056 03
- RAUCH, H W, SR**  
Coatings for mullite insulation  
LANGLEY-11150 876-10067 04
- RAUSCHENBACH, H S**  
Solar cell electrical connections  
LEWIS-12293 876-10260 08
- REIBLE, S A**  
Superconductive neuristor R-junction  
HQN-10871 876-10003 01
- REMBAUM, A**  
Catalysts for low-energy aldehyde processes  
NPO-13827 876-10519 04
- RHODES, C A**  
Contamination monitoring of fluids  
KSC-11037 876-10382 06
- RICCITIELLO, S R**  
Polymeric foams stable at high temperatures  
ARC-11008 876-10065 04
- RICE, E J**  
Attenuation of sound in ducts with acoustic treatment  
LEWIS-12686 876-10226 06
- RICE, R F**  
Advanced imaging communication system  
NPO-13545 876-10482 02
- RICE, S H**  
Elimination of color rings on film negatives  
GSFC-12110 876-10498 03



**RICE, W J**

Indicated mean-effective pressure  
instrument  
LEWIS-12661 B76-10542 06

**RICHMOND, R G**

Molecular beam generator  
MSC-14996 B76-10353 04  
Instrumentation for measuring low-level  
currents/voltages  
MSC-14855 B76-10480 02

**RIGLING, W S**

High-temperature flat-conductor cable  
M-FS-23451 B76-10144 01

**RIPPY, R R**

A linear phase demodulator  
GSFC-12018 B76-10291 01

**RITZ, R G**

Meal system for the elderly  
MSC-16062 B76-10530 05

**ROBBINS, R L**

Multiposition rescue litter  
MSC-16148 B76-10368 05

**ROBINSON, A R**

Computer-automated ultrasonic  
inspection system  
M-FS-23338 B76-10217 06

**ROCHAT, R D**

RF shaping of silicon ribbon  
M-FS-23424 B76-10258 08

**ROELKE, R J**

Improved automobile gas turbine  
engine  
LEWIS-12521 B76-10115 07

**ROGERS, J R**

Wingtip smoke generator  
ARC-10905 B76-10373 06

**ROMBERG, J M**

Prevention of design flaws in  
multicomputer systems  
MSC-14920 B76-10330 02

**ROSENTHAL, F L**

Graphic-to-digital conversion system  
M-FS-24410 B76-10019 02

**ROSITANO, S**

Measuring mandibular motions  
ARC-10956 B76-10362 05

**ROSTAFINSKI, W A**

Impedance of curved ducts  
LEWIS-12636 B76-10237 06

**ROUSH, R M, JR**

Transducer bonding kit  
MSC-19690 B76-10587 08

**RUBINSTEIN, R I**

Safety organizations and experts  
LEWIS-12742 B76-10598 09

**RUSSELL, G R**

Efficient copper-vapor pulsed laser  
NPO-13449 B76-10341 03

**RUTECKI, D J**

Containerless processing of tungsten  
M-FS-23509 B76-10422 08

**RUTZ, E M**

Combined GaAs laser outputs  
M-FS-23397 B76-10173 03  
Pulse transformer for GaAs laser  
M-FS-23399 B76-10185 03  
Spatially-coherent coupled  
semiconductor lasers  
M-FS-23396 B76-10500 03

**S****SALMASSY, O K**

3-D foam adhesive deposition  
M-FS-22739 B76-10271 08

**SALOMON, P M**

Data-storage compression scheme  
NPO-13488 B76-10017 02

Deflection amplifier for image  
dissectors  
NPO-13079 B76-10449 01

**SALTZ, K T**

Overhead tray for cable test system  
MSC-19488 B76-10270 08

**SANDBORN, V A**

Outer flow and turbulence in boundary  
layers  
M-FS-23286 B76-10100 06

**SANDERS, J A**

Battery-cell thermal test facility  
M-FS-23040 B76-10124 08

**SANDFORD, M C**

Miniature-angular-position transducer  
LANGLEY-11999 B76-10555 06

**SANDIFER, R J**

SANDTRACKS World map and stations  
predictions computer programs  
GSFC-12099 B76-10190 03

**SAUNDERS, F W**

Capacitively-coupled data receiver clipper  
stage  
MSC-14989 B76-10456 01

**SCHANBACHER, J R**

Stopping small liquid leaks  
KSC-10667 B76-10126 08

**SCHARMACK, D K**

Time-domain aircraft model  
MSC-16018 B76-10391 06

**SCHERTLER, R J**

All-weather ice information system  
LEWIS-12638 B76-10018 02

**SCHINDLER, R A**

Stepping optical path difference in an  
interferometer  
NPO-13569 B76-10033 03  
Improved interferometer beam splitter  
NPO-11932 B76-10041 03  
Servo corrects interferometer-mirror tilt  
NPO-13687 B76-10502 03

**SCHMIDT, L F**

Data-storage compression scheme  
NPO-13488 B76-10017 02

Anamorphic lens for tracking system  
NPO-13062 B76-10046 03

**SCHMIDT, W W**

Ultra-lightweight pressure vessels  
MSC-14983 B76-10266 08

**SCHMITT, R J**

Laser particulate spectrometer  
MSC-14969 B76-10331 03

**SCHOPPET, G C**

Recording-tape position sensor  
GSFC-12056 B76-10577 07

**SCHROCK, C G**

Fast measurement of bacterial  
susceptibility to antibiotics  
GSFC-10246 B76-10536 05

**SCHULZ, J R**

Extraction of urea and ammonium ion  
ARC-11064 B76-10515 04

**SCHULZE, A E**

Physician's modern 'Black Bag'  
MSC-14936 B76-10212 05

**SCHUMANN, L F**

Improved automobile gas turbine  
engine  
LEWIS-12521 B76-10115 07

**SCHUTT, J B**

Remote sensing of vegetation and soil  
GSFC-11976 B76-10490 03

**SCHWARTZ, E W**

Measurement of rapidly-changing  
heating rates  
LANGLEY-11380 B76-10097 06

**SCHWARTZ, S**

Solventless intumescent coatings  
ARC-10996 B76-10194 04

**SEGNA, D R**

Faceted solar energy collectors  
MSC-12687 B76-10182 03

**SEIDEL, R C**

Control system design  
LEWIS-12556 B76-10404 06  
Processing equations for state-space  
models  
LEWIS-12555 B76-10438 09  
Transfer-function parameters  
LEWIS-12612 B76-10605 09

**SELCUK, M K**

Improved solar-energy collector  
NPO-13813 B76-10486 03

**SELLERS, J F**

DYNGEN  
LEWIS-12506 B76-10108 06

**SEPPER, W**

Serial-to-parallel color-TV converter  
MSC-14844 B76-10027 02

**SERAFINI, T T**

Second-generation PMR polyimides  
LEWIS-12738 B76-10359 04

**SHACKLEFORD, J B**

Microprogrammed telemetry processor  
ARC-11061 B76-10460 01

**SHAFFER, R**

Solvent for 1-phenyl-3-pyrazolidone in  
photography  
GSFC-11992 B76-10496 03

**SHANSEN, S**

Stability of an elastic airplane  
ARC-11086 B76-10568 06

**SHARPSTEEN, J T**

DC drive system for cine/pulse  
cameras  
MSC-16085 B76-10497 03

**SHELTON, G B**

Band-elimination filter  
M-FS-23303 B76-10295 01

**SHER, A**

Pyroionic infrared detector  
LANGLEY-11921 B76-10204 04

**SHERFEY, J M**

Metal structures with parallel pores  
GSFC-10984 B76-10131 08

**SHETH, S G**

Flame-resistant elastomeric polymers  
MSC-16078 B76-10357 04

**SHILLINGER, G L, JR**

Accelerator for biomedical studies  
ARC-10898 B76-10367 05

**SHINN, J M, JR**

Economical solar-heating for homes  
LANGLEY-12135 B76-10571 07

**SHRIDER, K R**

Airport laser-Doppler  
M-FS-23423 B76-10174 03

**SHRIVER, E L**

Fabrication and applications of electrets  
M-FS-23437 B76-10429 08

**SHULMAN, A R**

Contrast enhancement of transparencies  
GSFC-11989 B76-10181 03  
Solvent for 1-phenyl-3-pyrazolidone in  
photography  
GSFC-11992 B76-10496 03

- SHULMAN, E L**  
Solvent for 1-phenyl-3-pyrazolidone in  
photography  
GSFC-11992 B76-10496 03
- SHUMATE, M S**  
Differential-optoacoustic absorption  
detector  
NPO-13759 B76-10494 03
- SIDMAN, K R**  
Flame-resistant elastomeric polymers  
MSC-16078 B76-10357 04
- SIERADSKI, L M**  
Double-focusing mass spectrometer  
NPO-13663 B76-10183 03
- SILVER, R H**  
Myocardial wall-thickness transducer  
NPO-13644 B76-10075 05
- SILVERMAN, C E**  
Braze/Rebraze process for CRES steel  
MSC-19600 B76-10280 08
- SIMMONDS, M R**  
Firefighter's breathing system  
MSC-14733 B76-10208 05
- SIMMONS, N E**  
Pulse detector  
MSC-16268 B76-10557 06
- SIMON, M K**  
Demodulator aids synchronization  
NPO-13605 B76-10164 02
- SIMON, W E**  
Velocity sensor for slow flows  
LANGLEY-11785 B76-10380 06
- SIMONSON, R B**  
Compound solder joints  
LANGLEY-11444 B76-10274 08
- SIMPSON, W G**  
Mixing ingredients in foam dispenser  
M-FS-20607 B76-10592 08
- SMID, M T**  
Elimination of thermally generated EMF's  
on PC boards  
MSC-16125 B76-10594 08
- SMITH, A**  
Economical custom LSI arrays  
M-FS-23262 B76-10004 01
- SMITH, I D**  
Cleaning large tanks and gas bottles  
MSC-14966 B76-10430 09
- SMITH, J G**  
Demodulator aids synchronization  
NPO-13605 B76-10164 02
- SMITH, T**  
Detecting contamination on a metal  
surface  
M-FS-19260 B76-10552 06
- SMOOT, D M**  
Field sampling fine-vacuum system  
KSC-10596 B76-10118 07
- SOBKIEWICZ, S A**  
Improved bonding of honeycomb panels  
MSC-19560 B76-10428 08
- SOLHEIM, C D**  
DC drive system for cine/pulse  
cameras  
MSC-16085 B76-10497 03
- SOLLOWAY, C B**  
Birth/death process model  
NPO-13616 B76-10213 05
- SPENCER, R S**  
Elimination of color rings on film  
negatives  
GSFC-12110 B76-10498 03
- SPERA, D A**  
Thermal fatigue-and-oxidation-resistant  
alloy  
LEWIS-12564 B76-10061 04
- Comparative thermal fatigue resistance  
LEWIS-12563 B76-10062 04
- SPRUILL, M**  
Soldering high-impedance Nichrome  
wire  
M-FS-1457 B76-10264 08
- SPUCK, W**  
Document restoration by computer  
techniques  
HQN-10910 B76-10597 09
- SRINIVASA, S R**  
Analysis of bonded joints  
LANGLEY-11871 B76-10231 06
- ST CLAIR, T L**  
Lightweight orthotic appliances  
LANGLEY-11918 B76-10076 05
- New diamine hardeners for epoxies  
LANGLEY-11823 B76-10522 04
- STAIMACH, C J**  
One-wire thermocouple  
MSC-16220 B76-10556 06
- STALMACH, C J, JR**  
Aluminum transfer method for plating  
plastics  
MSC-16221 B76-10593 08
- STANDISH, E M, JR**  
Development ephemeris number 96  
NPO-14002 B76-10507 03
- STANGE, W C**  
Cyclical bi-directional rotary actuator  
GSFC-11883 B76-10117 07
- STARNER, E R**  
Doppler extraction with a digital VCO  
MSC-14814 B76-10452 01
- STEIN, J A**  
Frozen-fluid line repair  
MSC-19132 B76-10227 06
- STEIN, M I**  
Multispectral-scanner image processing  
GSFC-12135 B76-10508 03
- Digital image-rectification system  
GSFC-12156 B76-10513 03
- STEINMETZ, C C**  
Electrode structure for uniform corona  
discharge  
M-FS-22617 B76-10045 03
- STEPHENS, J B**  
Atmospheric particle sampler  
NPO-13396 B76-10059 04
- Electrostatic-discharge ignition  
NPO-13798 B76-10487 03
- STEPHENS, W B**  
Analysis of axisymmetric shell structure  
LANGLEY-12059 B76-10398 06
- STEPKA, F S**  
Noncontaminating method for visualizing  
gas flow  
LEWIS-12076 B76-10088 06
- STEUDL, R M**  
Controlled linear clasper/loader  
GSFC-12105 B76-10432 08
- STEVENSON, G E**  
Manual trash compactor  
MSC-16039 B76-10390 06
- STOAP, L J**  
DC drive system for cine/pulse  
cameras  
MSC-16085 B76-10497 03
- STOCKER, P L**  
Laser extensometer  
M-FS-19259 B76-10030 03
- STONE, F D**  
ROUS bolt-tensioning monitor  
LANGLEY-12016 B76-10216 06
- STOUT, D F**  
Charge-sensitive amplifier with notched  
frequency response  
LANGLEY-11317 B76-10440 01
- Low-power programmable high-voltage  
supply  
LANGLEY-11316 B76-10458 01
- STOWERS, I F**  
Contamination monitoring of fluids  
KSC-11037 B76-10382 06
- STRINGER, E J**  
Plug-in light switches  
M-FS-24183 B76-10001 01
- Electrical-splicing connector  
M-FS-24254 B76-10300 01
- Plug-in circuit monitor  
MSC-19455 B76-10311 01
- Microprogrammable module  
MSC-19456 B76-10312 01
- STROM, T N**  
Cost saving synergistic shaft seal  
LEWIS-12119 B76-10081 06
- STRUZIK, E A**  
Thermal/acoustical insulation foam  
MSC-14795 B76-10195 04
- STUART, J L**  
Automated solvent concentrator  
NPO-13068 B76-10198 04
- Fraction-storage unit for  
drug-identification system  
NPO-13111 B76-10200 04
- STUMP, B L**  
Novel aminobenzyl and imidobenzyl  
benzenes  
LANGLEY-11843 B76-10058 04
- SULLIVAN, J L**  
Firefighter's breathing system  
MSC-14733 B76-10208 05
- SUPKIS, D E**  
Experimental data for new fire-retardant  
materials  
MSC-16022 B76-10361 04
- SUTHERLAND, I A**  
Machining titanium alloys  
M-FS-23006 B76-10283 08
- SWERDLING, B**  
Thermal-diode heat pipe  
ARC-10997 B76-10223 06
- SZUHAI, A B**  
Soft seat A-N fitting for vacuum use  
LEWIS-10130 B76-10408 07

## T

- TAMEKUNI, M**  
BUCLAP2  
LANGLEY-11696 B76-10111 06
- TAUSWORTHE, R C**  
Active retrodirective antenna  
NPO-13641 B76-10463 01
- TAYLOR, R C**  
Measuring mandibular motions  
ARC-10956 B76-10362 05
- TELFER, T A**  
Transistor-to-substrate bond quality  
M-FS-21931 B76-10137 01
- TELLIER, G F**  
Improved cryogenic shaft seals  
M-FS-19153 B76-10080 06
- TERAMURA, K**  
Graphical methods for variable sampling  
plans  
MSC-19279 B76-10431 08

## TERP, L S

Gas boost compressor  
MSC-14757 876-10415 07

## TESINSKY, J S

Flexible-pile thermal sealant  
MSC-19568 876-10371 06

## THALLER, L A

REDOX - electrochemical energy  
storage  
LEWIS-12220 876-10070 04

## THEALL, C E

Voltage-offset reduction in data  
transmitters  
MSC-14933 876-10321 02

## THOMAS, E F

Determination of radiative current in  
LED's  
GSFC-12034 876-10042 03

## THOMAS, E F, JR

Light pipes for LED measurements  
GSFC-11887 876-10034 03  
Beam patterns of light-emitting diodes  
GSFC-11890 876-10040 03

## THOMAS, N L

Optical alignment system  
ARC-10932 876-10178 03

## THOMAS, R D

Battery single-cell protection system  
LEWIS-12039 876-10306 01

## THOMPSON, J A

Precision centering vise  
KSC-11041 876-10409 07

## THOMSON, J A L

Standard aerosols for particle  
velocimeters  
M-FS-23075 876-10050 03

## THOMSON, J S L

Wind velocity measurement  
M-FS-23362 876-10172 03

## TICKNER, E G

Liquid-cooled bra for cancer detection  
ARC-11007 876-10533 05

## TIMOTHY, J G

Two-dimensional photon detector  
M-FS-23325 876-10048 03  
Microchannel detector array for X-rays  
and UV  
M-FS-23324 876-10053 03

## TITTMANN, B R

Reduction of acoustic losses by  
outgassing  
MSC-15985 876-10069 04

## TOCCI, L R

A passive chevron replicator  
LANGLEY-11906 876-10441 01

## TOMA, J

Portable, wind sensitive directional air  
sampler  
LEWIS-12743 876-10489 03

## TOMASZEWSKI, I B

Independent trajectory determination  
system  
GSFC-11923 876-10569 06

## TOSHI, T Y

Effects of mismatch on group delay of  
microwave transmission  
NPO-13863 876-10478 02

## TOTH, J M, JR

General instability analysis  
M-FS-23407 876-10563 06

## TOWNSEND, D P

Fatigue life of spur and helical gear  
sets  
LEWIS-12596 876-10224 06

## TRIPP, L L

BUCLAP2  
LANGLEY-11696 876-10111 06

## TROENDLE, J A

Zero-angle helical coil  
GSFC-10969 876-10085 06

## TRUST, R D

Transient thermal analysis of fluid  
systems  
MSC-19502 876-10401 06

## TURNAGE, J E

Ultraviolet fire detector  
M-FS-21577 876-10016 02

## TUTHILL, G A

Mechanical positioner  
MSC-15817 876-10245 07

## TYSON, B J

Separation of water from air samples  
ARC-10890 876-10205 04

## U

## UKANWA, A O

Handbook of liquid metals  
M-FS-23355 876-10072 04

## ULRICH, D R

Nucleation of electronic-crystal regions  
M-FS-23049 876-10524 04

## UPDIKE, O L

Measuring trace dispersants in gas  
streams  
ARC-10896 876-10374 06

## V

## VALLOTON, W C

An artificial leg for hip disarticulation  
ARC-10916 876-10541 05

## VAN AUSSDAL, R K

Powered wheel for aircraft  
LANGLEY-12053 876-10411 07

## VAN FOSSEN, G J, JR

Heat-transfer coefficients of pin-finned  
cylinders  
LEWIS-12557 876-10554 06

## VAN WIE, P H

Digital image-rectification system  
GSFC-12156 876-10513 03

## VANASSE, M A

Improved soldering iron tip  
M-FS-19349 876-10145 01

## VANIMAN, J L

Self-contained constant-temperature  
heat absorber  
M-FS-22989 876-10091 06

## VANMELLE, M J

Temperature reference for microwave  
radiometer calibration  
LANGLEY-11355 876-10503 03

## VANNUCCI, R D

Second-generation PMR polyimides  
LEWIS-12738 876-10359 04

## VARY, A

Ultrasonic measurement of fracture  
toughness  
LEWIS-12642 876-10372 06

## VAUGHAN, E T

Input/output error analyzer  
GSFC-12132 876-10610 09

## VERBER, C M

Photorefractive page composer  
M-FS-23419 876-10171 03

## VILLARREAL, S

Tracking a phase-shift-keyed signal  
MSC-16170 876-10481 02

## VINE, J

Magnifying image intensifier  
GSFC-12010 876-10506 03

## VISWANATHAN, A V

BUCLAP2  
LANGLEY-11696 876-10111 06

## VON TIESENHAUSEN, G F

Solar concentrator/absorber  
M-FS-23428 876-10253 07

## VORHABEN, K H

Unichromatic-carrier color-TV system  
MSC-14683 876-10026 02

## W

## WAGNER, P A

Atmosphere-generating system  
MSC-14713 876-10389 06

## WAKEFIELD, M E

Yield-pressure determination  
MSC-14655 876-10581 08

## WAKELAND, W

Birth/death process model  
NPO-13616 876-10213 05

## WALKER, T C

Computer-automated ultrasonic  
inspection system  
M-FS-23338 876-10217 06

## WALKER, W L

Low-cost solar reflectors  
NPO-13707 876-10123 08

## WALSH, J M

Specific-ion electrodes for measuring Ag  
ions  
MSC-14906 876-10068 04

## WALTER, H U

Ellipsometer for measurement in  
ultrahigh vacuum  
M-FS-23130 876-10035 03

## WAMSTEKER, W

Low-light-level integrating video system  
M-FS-23288 876-10347 03

## WANG, T G

Acoustic-energy shaping of meltable  
metals  
NPO-13802 876-10423 08

## WARD, C M

Improved wet-slug capacitor  
LANGLEY-11720 876-10008 01

## WARNER, D M

Impact response analyses  
M-FS-23335 876-10559 06

## WARREN, W B

Signal enhancement filters  
MSC-14907 876-10453 01

## WARSHAY, M

REDOX - electrochemical energy  
storage  
LEWIS-12220 876-10070 04

## WASSERBAUER, C A

Predicting off-design performance of  
radial-inflow turbines  
LEWIS-12500 876-10242 06

## WATERS, W J

Thermal fatigue-and-oxidation-resistant  
alloy  
LEWIS-12564 876-10061 04

## WATSON, G H

Thermal-radiation model  
M-FS-23538 876-10562 06

## WEAGANT, R

Optical bias assembly  
MSC-14412 876-10051 03

- WEBB, W E**  
Bit-error rates in optical communications  
M-FS-23340 B76-10286 09
- WEBBON, B W**  
Sublimator/evaporator heat sink  
ARC-10912 B76-10384 06
- WEITZENKAMP, L A**  
Ellipsometer for measurement in ultrahigh vacuum  
M-FS-23130 B76-10035 03
- WELLS, T G**  
Computer-automated ultrasonic inspection system  
M-FS-23338 B76-10217 06
- WENNAGEL, G J**  
External heater for cryogenic vessels  
MSC-14056 B76-10337 03
- WESSELSKI, C J**  
Low-onset-rate energy absorber  
MSC-12279 B76-10385 06
- WHEELER, J T**  
Power supply with optical-isolator control  
HQN-10827 B76-10466 01
- WHETSTONE, W D**  
SPAR Structural-performance analysis and redesign  
LANGLEY-12062 B76-10399 06
- WHIFFEN, E L**  
Electron-beam welder alignment  
MSC-19642 B76-10269 08
- WILCK, H C**  
Subcarrier signal combiner for arrayed antennas  
NPO-13723 B76-10329 02
- WILKINS, J R**  
Signal processing and display for electrochemical data  
LANGLEY-11922 B76-10327 02
- WILKOWSKI, J C**  
Energy-absorbing attenuator  
MSC-17473 B76-10419 07
- WILLIAMS, B A**  
Liquid-cooled bra for cancer detection  
ARC-11007 B76-10533 05
- WILLIAMS, B B**  
Stripper for silicone polymers  
MSC-19380 B76-10267 08
- WILLIAMS, R J**  
Electrolyte cells measure oxygen fugacities  
MSC-16089 B76-10523 04
- WILSON, D J**  
Airport laser-Doppler  
M-FS-23423 B76-10174 03
- WILSON, D S**  
Pump failure monitor  
M-FS-23366 B76-10219 06
- WILSON, I J**  
Forming hard aluminum in complex shapes  
MSC-19693 B76-10579 08
- WILSON, J W**  
Proton tissue dose  
LANGLEY-11802 B76-10078 05
- WILSON, R L**  
Capacitive shaft-angle encoder  
ARC-10897 B76-10386 06
- WING, L D.**  
Tangent-ogive nose cones  
GSFC-11468 B76-10107 06
- WINGROVE, R C**  
Estimating aircraft states  
ARC-10969 B76-10567 06
- WINKELSTEIN, R A**  
Subcarrier signal combiner for arrayed antennas  
NPO-13723 B76-10329 02
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